CITY OF BEAUMONT, TEXAS

BEAUMONT
TEXAS

PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS

ISSUED FOR BID

JANUARY 2022

ROBIN MOUTON
MAYOR

KYLE HAYES
CITY MANAGER

BART BARTKOWIAK
PUBLIC WORKS DIRECTOR

ALBERT "A.J." TURNER
COUNCILMEMBER AT LARGE

RANDY FELDSCHAU
MAYOR PRO TEM & COUNCILMEMBER AT LARGE

TAYLOR NEILD
COUNCILMEMBER WARD 1

MIKE GETZ
COUNCILMEMBER WARD 2

AUDWIN M. SAMUEL
COUNCILMEMBER WARD 3

CHARLES DURIO
COUNCILMEMBER WARD 4

APPROVED BY:

BLAKE FREDIEU
WATER UTILITIES DESIGNER II

JOHN PIPPINS III, EIT
WATER UTILITIES DESIGN MANAGER

AMALIA VILLARREAL, P.E.
CITY ENGINEER

BART BARTKOWIAK
DIRECTOR OF PUBLIC WORKS
AND TECHNOLOGY SERVICES

FREESE AND NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY BID NO. WU0222-12
BMT21704

STATE OF TEXAS
SOMNATH CHUKURI
118309
LICENSED
PROFESSIONAL ENGINEER
02-01-2022

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING
FIRM F-2144

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GENERAL NOTES

1. THE FOLLOWING NOTES ARE GENERAL AND APPLY TO ALL SHEETS OF THESE CONTRACT DOCUMENTS AS IF THEY WERE WRITTEN IN THEIR ENTIRETY ON EACH SHEET.

2. EXISTING STRUCTURES, UTILITIES AND PIPING ARE SHOWN FROM AVAILABLE RECORDS AT THE TIME THIS PLAN SET WAS DEVELOPED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE AND VERIFY THE LOCATION AND DEPTH OF ALL EXISTING STRUCTURES, UTILITIES AND PIPING WITHIN THE CONSTRUCTION AREA PRIOR TO THE BEGINNING OF CONSTRUCTION. ANY DAMAGE TO THE EXISTING STRUCTURES, UTILITIES AND PIPING THAT IS NOT RELATED TO THE NEW CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

3. PRIOR TO FABRICATION OF NEW PIPING AND EXCAVATION FOR NEW STRUCTURES, ELECTRICAL CONDUIT, NEW PIPING AND/OR OTHER PROPOSED UTILITIES, CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING PIPING AND UTILITIES IN THE CONSTRUCTION AREA. AT TIE-IN CONNECTION LOCATIONS, VERIFY EXISTING CONDITIONS AND ELEVATIONS. BEFORE FABRICATION OF NEW PIPING. THE CONTRACTOR SHALL INCLUDE IN THE BID COST FOR TEMPORARILY RELOCATING EXISTING UTILITIES AS REQUIRED FOR CONSTRUCTION OF PROPOSED ITEMS AND REINSTALLING THEM.

4. ALL PIPELINES SHALL HAVE A MINIMUM COVER OF 36" (UNLESS NOTED OTHERWISE). PIPES SHALL BE ROUTED AS SHOWN UNLESS MINOR REVISIONS ARE NECESSARY TO MISS EXISTING PIPES, STRUCTURES, ETC. CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL FITTINGS AND ADAPTERS REQUIRED TO MAKE THE ROUTING CHANGES. CONTRACTOR SHALL INCLUDE COST FOR THIS IN THE BID. ANY VARIANCES SHALL BE APPROVED BY ENGINEER.

5. CONTRACTOR SHALL MAKE CONNECTIONS TO EXISTING PIPE, STRUCTURES, EQUIPMENT, ETC. AS REQUIRED AND SHALL PROVIDE ALL FITTINGS, ADAPTERS AND APPURTENANCES REQUIRED TO MAKE THE CONNECTIONS. PROVIDE ALL SUPPORTS REQUIRED FOR A RIGID INSTALLATION AND TO HAVE A COMPLETE AND WORKING SYSTEM.

6. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM DEFLECTION FOR PIPE JOINTS.

7. PIPES DESIGNATED TO BE DEMOLISHED MAY BE COMPLETELY REMOVED, OR MAY BE CUT AND ALL OPEN ENDS PLUGGED OR CAPPED, UNLESS OTHERWISE DIRECTED. PIPES ABANDONED IN PLACE SHALL BE CAPPED WITH EITHER CONCRETE, BLIND FLANGE OR M.J. PLUG. ABANDONED PIPING UNDER NEW ROADS AND STRUCTURES SHALL BE COMPLETELY REMOVED. BACKFILL TRENCH WITH LEAN CONC. OR STRUCTURAL EARTH FILL AND COMPACT IN ACCORDANCE WITH SPECIFICATIONS. PIPES TO BE ABANDONED IN PLACE SHALL BE EMPTIED OF ALL CONTENTS. ALL TEMPORARY PIPES, FITTINGS AND SUPPORTS SHALL BE REMOVED COMPLETELY PRIOR TO FINAL COMPLETION.

8. CONTRACTOR SHALL VERIFY THAT PIPING SHOWN TO BE ABANDONED OR AS PREVIOUSLY ABANDONED IS NO LONGER IN SERVICE. LINES IN SERVICE SHALL BE MAINTAINED UNTIL NO LONGER REQUIRED BY THE OWNER.

9. EXISTING PIPES ABANDONED IN PLACE OR TO BE REMOVED MAY NOT BE SHOWN. WHERE PIPING TO BE ABANDONED MUST REMAIN IN SERVICE UNTIL COMPLETION OF OTHER PHASE WORK, AND IT CONFLICTS WITH NEW PIPING, TEMPORARILY RELOCATE TO MAINTAIN SERVICE. CONTRACTOR SHALL PROVIDE ALL NECESSARY APPURTENANCES FOR THE TEMPORARY RELOCATION.

10. CONTRACTOR SHALL REROUTE THE EXISTING PIPING IF REQUIRED TO AVOID THE PROPOSED STRUCTURES. THE EXISTING PIPE SHALL REMAIN IN SERVICE UNTIL NEW PIPING AND FACILITIES ARE READY TO BE PLACED INTO SERVICE. DOWNTIME SHALL BE COORDINATED WITH THE OWNER UNLESS SPECIFIED OTHERWISE IN THE CONTRACT DOCUMENTS OR SHOWN OTHERWISE. ALL REMAINING PIPING, WHETHER IN SERVICE OR ABANDONED, SHALL BE NOTED ON THE RECORD DRAWINGS.

11. ALL PENETRATIONS (EXISTING AND PROPOSED) OF THE WALLS SHALL BE SEALED PER TYPICAL/STANDARD DETAILS OR AS DIRECTED BY ENGINEER.

12. THE CONTRACTOR SHALL TAKE SPECIAL PRECAUTIONS IN THE VICINITY OF ANY OVERHEAD ELECTRIC LINES. CONTRACTOR SHALL ABIDE BY NATIONAL ELECTRIC CODE AND ANY REQUIREMENT BY OWNER OF ELECTRIC LINES.

13. PROVIDE, INSTALL, AND REMOVE ALL SHEETING/SHORING REQUIRED TO PROTECT ALL EXISTING STRUCTURES, PIPES AND FACILITIES.

14. WHERE EXISTING PIPES, VALVES, ETC. ARE NOTED FOR REUSE : ALLOW OWNER TO EXAMINE ITEMS PRIOR TO REINSTALLING.

15. ON ALL STRUCTURES SHOWN TO BE DEMOLISHED : SALVAGE ITEMS FOR OWNER AS INDICATED ON PLANS OR SPECIFICATIONS. REMOVE AND DISPOSE OF ALL OTHER MATERIALS, PIPE AND COMPONENTS WITHIN THE STRUCTURE INCLUDING THE CONC. STRUCTURE AND ANY CONC. BACKFILL ASSOCIATED WITH STRUCTURE. ALL COMPONENTS MAY NOT BE SHOWN. FILL EXCAVATION WITH COMPACTED EARTH TO MATCH SURROUNDING GRADE AND MAINTAIN EXISTING DRAINAGE PATTERN.

16. ALL DEMOLISHED STRUCTURES AND NON-SALVAGED EQUIPMENT AS WELL AS EXCESS EXCAVATED SOILS, SHALL BE REMOVED AND DISPOSED OF AS SOON AS POSSIBLE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL LAWS, REGULATIONS AND OTHER ORDINANCES AT NO ADDITIONAL COST TO OWNER.

17. CONTRACTOR SHALL REPAIR ANY EXISTING PAVEMENT DEMOLISHED FOR PIPING INSTALLATION OR MODIFICATION WORK. THE PAVEMENT SHALL BE RETURNED TO EXISTING CONDITION AS SHOWN IN PAVEMENT REPAIR DETAILS.

18. CONTRACTOR SHALL COMPLETELY REMOVE AND PROPERLY DISPOSE OF ALL STRUCTURES DESIGNATED FOR DEMOLITION, AS SOON AS POSSIBLE.

19. BEFORE BEGINNING CONSTRUCTION NOTIFY ENGINEER OF ANY DISCREPANCIES OR CONFLICTS FOUND IN DRAWINGS AND/OR FIELD DIMENSIONS.

20. CONTRACTOR SHALL VERIFY LOCATION OF ALL ARCHITECTURAL, MECHANICAL AND ELECTRICAL ITEMS BEFORE PLACING ANY STRUCTURAL STEEL OR CONCRETE. STRUCTURAL DIMENSIONS AND OPENINGS CONTROLLED BY ARCHITECTURAL, MECHANICAL OR ELECTRICAL EQUIPMENT SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

21. STRUCTURES HAVE BEEN DESIGNED FOR OPERATIONAL LOADS ON COMPLETED STRUCTURES. DURING CONSTRUCTION, STRUCTURES SHALL BE PROTECTED BY BRACING OR WHATEVER MEANS REQUIRED WHEREVER EXCESSIVE CONSTRUCTION LOADS OCCUR.

22. MECHANICAL AND ELECTRICAL EQUIPMENT SUPPORTS, ANCHORAGES, OPENING, RECESSES AND REVEALS NOT SHOWN ON THE STRUCTURAL DRAWINGS BUT REQUIRED BY OTHER CONTRACT DRAWINGS SHALL BE PROVIDED PRIOR TO CASTING CONCRETE.

23. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CONDITIONS INCLUDING LOCATION AND DIMENSIONS OF ALL EXISTING CONSTRUCTION AND UTILITIES. CONTRACTOR SHALL NOTIFY ENGINEER IF THERE IS A CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND EXISTING CONSTRUCTION BEFORE PROCEEDING WITH WORK.

24. THE CONTRACTOR SHALL CONTACT THE PROPER UTILITY REPRESENTATIVE FOR QUESTIONS AND/OR COORDINATION OF ANY EXISTING UTILITIES.

25. CONTRACTOR SHALL MAKE TEMPORARY ARRANGEMENTS TO CONTINUE FEEDING PLANT CHEMICALS AT THE REQUIRED RATE DURING CONSTRUCTION. SUBMIT A PLAN FOR REVIEW AND APPROVAL PRIOR TO COMMENCING WORK. COORDINATE WORK WITH THE CONSTRUCTION SEQUENCE.

26. ALL NEW UNISTRUT, ANCHORS, SUPPORT SYSTEMS AND FASTENING HARDWARE SHALL BE 316 STAINLESS STEEL WITH ANTI-SEIZE COMPOUND APPLIED.

27. EXISTING CONTOURS IN PLANS ARE SHOWN FOR TERRAIN RELIEF ONLY. ALL ELEVATIONS SHALL BE VERIFIED.

28. EXCAVATION ADJACENT TO OR CROSSING EXISTING UTILITIES THAT ARE TO REMAIN, SHALL BE PERFORMED BY HAND AND IN SUCH A MATTER AS TO AVOID DAMAGE TO EXISTING UTILITIES.

29. ALL DEMOLISHED PIPING AND APPURTENANCES, CONDUITS, ELECTRIC WIRING AND EQUIPMENT ARE SUBJECT TO SALVAGE BY THE OWNER. OWNER WILL DECIDE IF THESE ITEMS SHALL BE DISPOSED OF BY THE CONTRACTOR. ALL DISPOSED EQUIPMENT WILL BE REMOVED FROM THE SITE BY THE CONTRACTOR.

30. ANY EXISTING PIPING THAT IS AFFECTED BY NEW CONSTRUCTION OR NEW PIPING INSTALLATION, UNLESS DEMOLISHED AND REMOVED, SHALL BE RETURNED TO ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE OWNER. PIPING REPAIR SHALL INCLUDE CONSIDERATION FOR BACKFILL, ENCASEMENT, SUPPORTS, RESTRAINTS, FITTINGS, VALVES, HEAT TRACINGS, INSULATION AND ANY TYPICAL OR SPECIAL COATINGS THAT ARE APPLIED TO THE INTERIOR AND/ OR EXTERIOR OF THE PIPING AND IT'S APPURTENANCES.

31. UNLOADING AND STORAGE OF EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR WHO SHALL INSPECT ALL EQUIPMENT FOR APPARENT DAMAGE. EQUIPMENT WHICH IS FOUND TO HAVE DAMAGED COMPONENT(S) WILL NOT BE ACCEPTED UNTIL THE DAMAGED COMPONENT(S) ARE PROPERLY REPAIRED OR REPLACED BY THE VENDOR. ALL MAJOR EQUIPMENT INCLUDING, BUT NOT LIMITED TO, GATES, PUMPS, MOTORS, VALVES, AND ELECTRICAL EQUIPMENT SHALL BE STORED INDOORS. WHEN THIS EQUIPMENT IS STORED INDOORS, IT SHALL NEVER BE IN DIRECT SUNLIGHT, AND THE INDOOR TEMPERATURE SHALL BE MAINTAINED AT A LEVEL SATISFACTORY TO THE VENDOR. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE INDOOR STORAGE FACILITY OR ENCLOSURE.

32. METHODS OF PROVIDING FOR TRENCH SAFETY:

    A. PROTECTIVE SYSTEMS SHALL BE AS DEFINED AND DESCRIBED IN 29 CFR 1962.652, "REQUIREMENTS FOR PROTECTIVE SYSTEMS"

    B. IT IS THE DUTY, RESPONSIBILITY AND PREROGATIVE OF THE CONTRACTOR TO DETERMINE THE SPECIFIC APPLICABILITY OF ANY PROPOSED TRENCH SAFETY SYSTEM FOR EACH FIELD CONDITION ENCOUNTERED ON THE PROJECT. CONTRACTOR SPECIFICALLY HOLDS THE OWNER, ENGINEER, AND ANY OTHER OF THE DESIGNATED REPRESENTATIVES HARMLESS IN ANY ACTIONS RESULTING FROM THE FAILURE OR INADEQUACY OF THE TRENCH SAFETY SYSTEM USED TO COMPLETE THE PROJECT.

    C. UNLESS OTHERWISE NOTED ON THE DRAWING OR EXCLUDED WITHIN THIS NOTE, SLOPING/BENCHING, TRENCH SHIELDING WITH TRENCH BOXES, AND/OR SHEETING/SHORING/BRACING PROTECTIVE SYSTEM MAY BE USED ON THIS PROJECT.

    D. RESTRICTIONS ON THE USE OF THE VARIOUS PROTECTIVE SYSTEM FOR THIS PROJECT ARE AS FOLLOWS:

1. SLOPING OR BENCHING	WHERE SPACE PERMITS
2. TRENCH SHIELDS/BOXES	LIMIT OF TWO STACKED ON ONE ANOTHER
3. SHEETING/SHORING/BRACING	NO RESTRICTION

33. CONTRACTOR SHALL NOT INTERFERE WITH ANY PLANT OPERATIONS, PLANT OPERATING STAFF FUNCTIONS, OR CHEMICAL DELIVERIES.

34. CONTRACTOR IS RESPONSIBLE FOR MEETING ALL APPROPRIATE REGULATIONS IN CHEMICAL HANDLING AND DISPOSAL.

ISSUED FOR BID

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

02-01-2022

STATE OF TEXAS · SOMNATH CHILUKURI · 118309 · LICENSED PROFESSIONAL ENGINEER

Somnath Chilukuri

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
GENERAL

INDEX OF DRAWINGS & GENERAL NOTES

F&N JOB NO. BMT21704
DATE 01/28/2022
DESIGNED RT
DRAWN BH
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FILE NAME GN-BMT-PL-INDX.dwg

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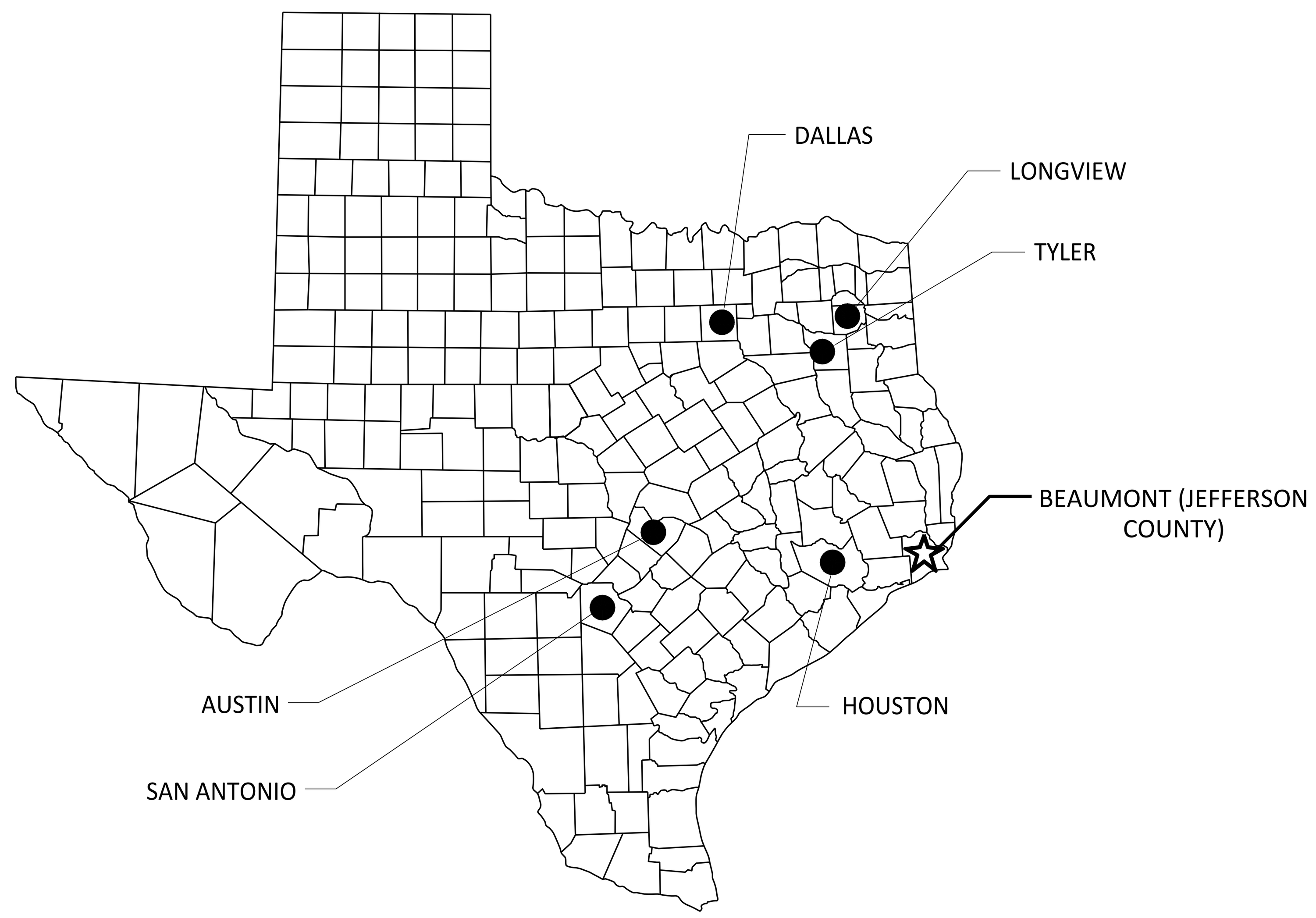

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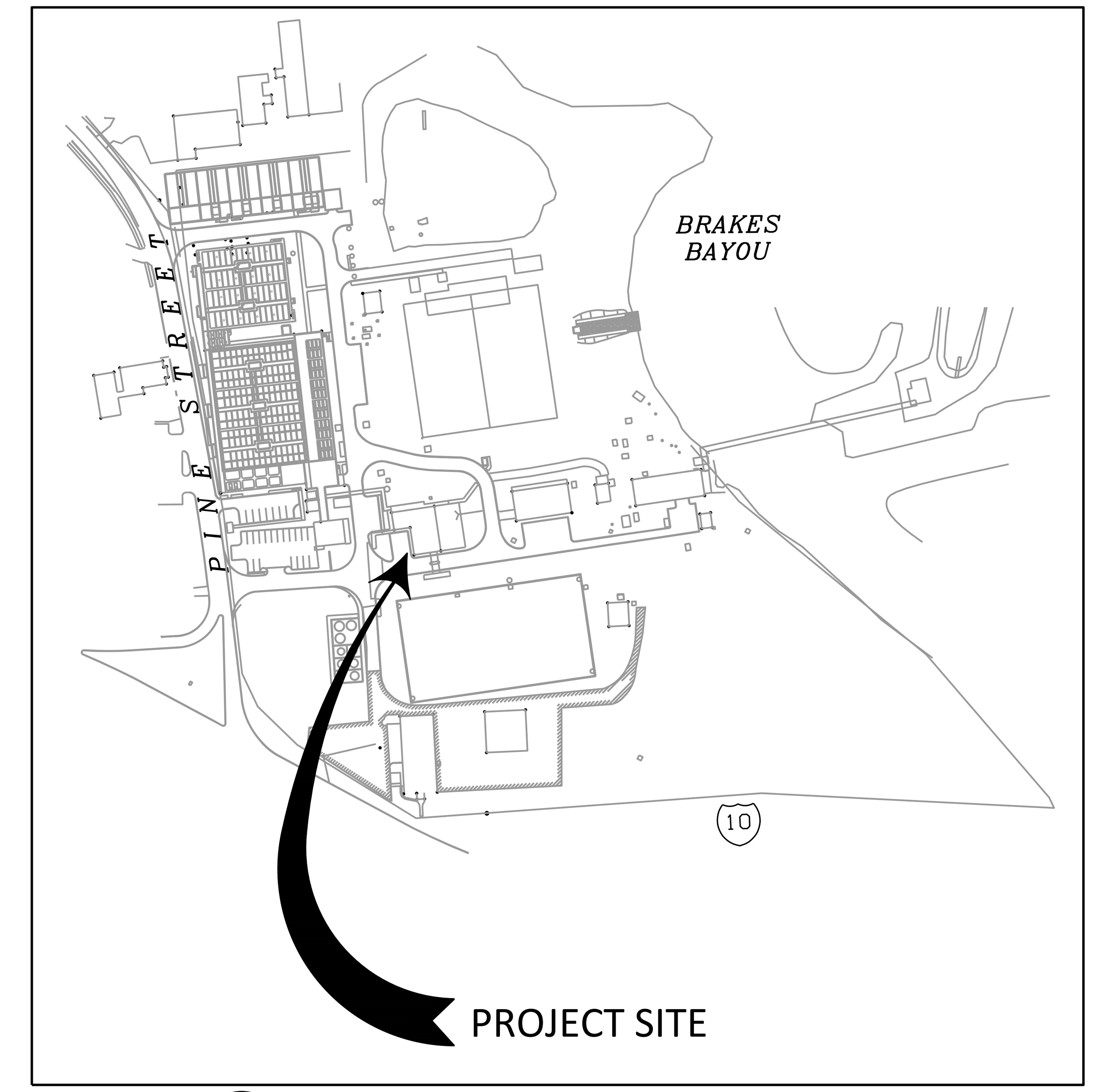

NORTH

BEAUMONT PLANT VICINITY MAP
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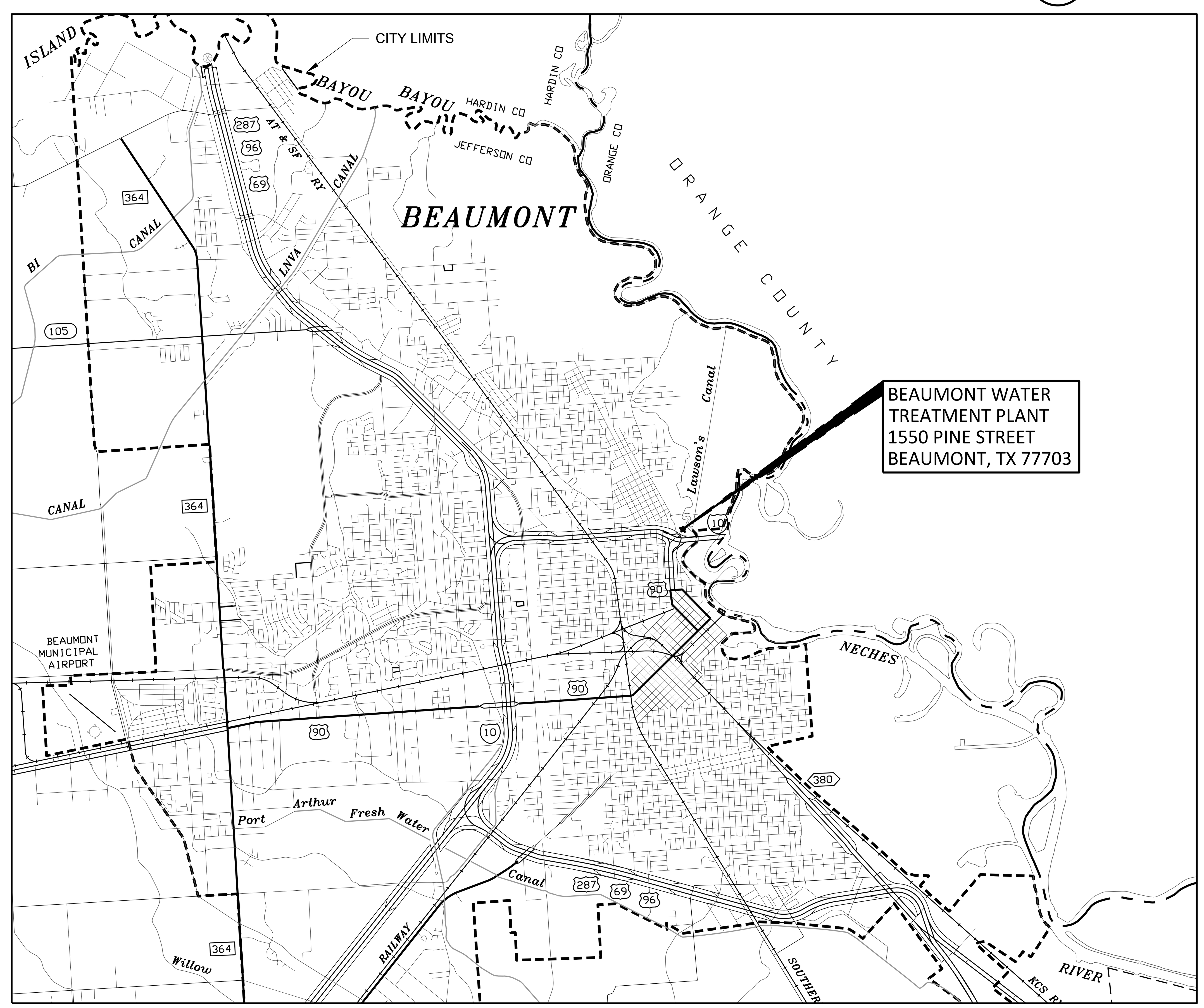

NORTH

PROJECT LOCATION
N.T.S.

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

STATE OF TEXAS
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Phone - (832) 456-4700
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PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS

GENERAL

VICINITY MAPS

NO.	ISSUE	BY	DATE

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SEQ. 2

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GENERAL NOTES

1. DESIGN IS IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE, LOCAL AMENDMENTS, AND APPLICABLE CODE REFERENCED STANDARDS.

2. CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH APPLICABLE OSHA, STATE, AND LOCAL REGULATIONS. THIS DESIGN IS NOT INTENDED TO CONFLICT WITH SAFETY OR APPLICABLE REGULATIONS OR TO RELIEVE THE CONTRACTOR OF COMPLIANCE WITH THESE REQUIREMENTS. IN CASE OF CONFLICT WITH SAFETY OR APPLICABLE REGULATIONS, CONTACT THE ENGINEER FOR GUIDANCE BEFORE PROCEEDING WITH FABRICATION OR CONSTRUCTION.

3. DEAD LOADS: ACTUAL WEIGHTS OF ALL MATERIALS OF CONSTRUCTION AND FIXED SERVICE EQUIPMENT.

4. LIVE LOADS:
   A. MECH, ELECT, AND EQUIP AREAS: 150 PSF
   B. STAIRS, LANDINGS, WALKWAYS, PLATFORMS, AND OTHER AREAS: 100 PSF
   C. GRATING OR COVER PLATES: SAME AS SURROUNDING AREA BUT NOT LESS THAN 100 PSF. IF SUBJECTED TO VEHICULAR TRAFFIC, LIVE LOAD SHALL CORRESPOND TO AASHTO HL-93 WHEEL LOAD.

5. LATERAL LOADS:
   A. RISK CATEGORY III
   B. WIND LOADS:
      i. ULTIMATE DESIGN WIND SPEED (3-SEC PEAK GUST): V_{ULT} = 144 MPH
      ii. WIND EXPOSURE: C
   C. SEISMIC LOADS:
      i. SEISMIC IMPORTANCE FACTOR: I = 1.25
      ii. MAPPED SPECTRAL ACCELERATIONS: S_S = 0.083, S_1 = 0.045
      iii. SITE CLASS: D
      iv. SPECTRAL RESPONSE COEFFICIENTS: S_{DS} = 0.089, S_{D1} = 0.07
      vi. SEISMIC DESIGN CATEGORY: B

6. SUBSTITUTION OF EXPANSION ANCHORS FOR CAST-IN-PLACE OR POST-INSTALLED ADHESIVE ANCHORS SHOWN ON THE DRAWINGS WILL NOT BE PERMITTED UNLESS APPROVED BY THE ENGINEER IN ADVANCE.

7. VERIFY ALL DIMENSIONS, ELEVATIONS, OPENING SIZES, AND MECHANICAL AND ELECTRICAL EQUIPMENT WEIGHTS PRIOR TO STARTING WORK.

8. REMOVE ALL ABANDONED FOUNDATIONS, UTILITIES, PIPELINES, ETC. THAT INTERFERE WITH NEW CONSTRUCTION.

9. FIELD VERIFY ALL EXISTING CONDITIONS, INCLUDING LOCATION AND DIMENSIONS OF ALL EXISTING CONSTRUCTION AND UTILITIES. NOTIFY ENGINEER IF THERE IS A CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND EXISTING CONDITIONS BEFORE PROCEEDING WITH WORK.

10. PROVIDE EXCAVATION SHORING TO PROTECT AND SUPPORT FOUNDATION SOILS UNDER EXISTING STRUCTURES.

11. THE STRUCTURES ARE DESIGNED FOR STABILITY IN THE FINAL CONDITION ONLY. PROVIDE TEMPORARY BRACING AND SHORING AS REQUIRED FOR STABILITY DURING CONSTRUCTION.

12. PLANS, SECTIONS, AND DETAILS ARE NOT TO BE SCALED FOR DETERMINATION OF QUANTITIES, LENGTHS, OR FIT OF MATERIALS.

13. SEE OTHER DISCIPLINE DRAWINGS FOR SIZE AND LOCATION OF ALL OPENINGS, DEPRESSIONS, OFFSETS, SLEEVES, CURBS, PADS, INSERTS, ETC. NOT SHOWN ON STRUCTURAL DRAWINGS. BEFORE FABRICATION OF MATERIALS, COORDINATE WITH MECHANICAL AND ELECTRICAL EQUIPMENT REQUIREMENTS.

14. THE GENERAL NOTES AND TYPICAL DETAILS ARE GENERAL AND APPLY TO THE ENTIRE PROJECT EXCEPT WHERE THERE ARE SPECIFIC INDICATIONS TO THE CONTRARY.

CONCRETE

1. CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI UNLESS SPECIFIED OTHERWISE.

2. ALL REINFORCING SHALL BE IN ACCORDANCE WITH ASTM A615, GRADE 60, DEFORMED.

3. CONCRETE CLEAR COVER OVER REINFORCING SHALL BE IN ACCORDANCE WITH ACI 350, LISTED BELOW, UNLESS OTHERWISE NOTED.
   A. CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3"
   B. EXPOSED TO EARTH OR WEATHER
      i. #6 BARS AND LARGER: 2"
      ii. #5 BARS AND SMALLER: 1-1/2"
   C. NOT EXPOSED TO EARTH OR WEATHER: 1-1/2"

4. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4" INSIDE FORMS OR TOOLED TO 3/4" RADIUS ON SLABS, UNLESS NOTED OTHERWISE.

5. ADDITIONAL CONSTRUCTION JOINTS SHALL HAVE PRIOR APPROVAL OF THE ENGINEER.

6. PENETRATIONS OTHER THAN SHOWN SHALL NOT BE ALLOWED WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

7. IN CASES WHERE REINFORCING BARS CANNOT BE EXTENDED AS FAR AS REQUIRED DUE TO THE LIMITED EXTENT OF THE ADJACENT CONCRETE STRUCTURE, THE BARS SHALL EXTEND AS FAR AS POSSIBLE AND END IN STANDARD HOOKS.

8. HOOKS SHOWN ON DRAWINGS SHALL BE ASSUMED TO BE STANDARD HOOKS PER ACI 350, UNLESS NOTED OTHERWISE.

9. CONDUITS AND PIPING EMBEDDED IN CONCRETE SHALL BE SPACED A MINIMUM OF FOUR DIAMETERS AND THE OUTSIDE DIAMETER SHALL BE LESS THAN 30% OF THE MEMBER THICKNESS PLACED BETWEEN LAYERS OF REINFORCING.

10. ALL REINFORCING SHALL BE CONTINUOUS. CONTINUOUS BARS SHALL LAP 48 BAR DIAMETERS OF SMALLER BAR LAPPED, UNLESS NOTED OTHERWISE. ALL REBAR EMBEDMENT LENGTHS SHALL BE 36 BAR DIAMETERS, UNLESS NOTED OTHERWISE.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL FORMING, TEMPORARY BRACING AND SHORING.

FOUNDATION

1. EXCAVATION DESIGN AND SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR. ANY SLOPES SHOWN ARE A MAXIMUM AND SHALL BE DECREASED AS REQUIRED FOR SAFETY OR TO MEET OSHA REQUIREMENTS.

2. EXCAVATION, SUBGRADE PREPARATION, AND BACKFILL
   A. REMOVE THE SURFICIAL VEGETATION, ROOTS, ORGANIC MATERIAL, AND DEBRIS TO A MINIMUM DEPTH OF 12".
   B. EXCAVATE THE SITE TO THE PROPOSED FINISHED SUBGRADE FOR EACH STRUCTURE WHERE CUTTING TO SUBGRADE IS REQUIRED. EXTEND THE LATERAL LIMITS OF THE EXCAVATION 5'-0" BEYOND THE PERIMETER OF THE FOUNDATION, UNLESS NOTED OTHERWISE.
   C. SUBGRADE SHALL BE PREPARED IN ACCORDANCE WITH THE FOLLOWING PROCEDURES AND AS INDICATED IN THE GEOTECHNICAL STUDY.
   D. CHEMICAL STORAGE FACILITY:
      i. REMOVE EXISTING FILL AND CONSTRUCTION DEBRIS FROM BENEATH THE FOUNDATION AREA DOWN TO AN ABANDONED SLAB THAT OCCURS 5'-6" TO 7'-6" BELOW EXISTING GRADE. THE SAND AND CLAY SOIL ABOVE THE CONSTRUCTION DEBRIS MAY BE STOCKPILED SEPARATELY FROM THE SOIL MIXED WITH CONSTRUCTION DEBRIS. ALL CONSTRUCTION DEBRIS AND SOIL SHALL BE REMOVED FROM THE EXISTING SLAB.
      ii. BACKFILL SHALL BE PLACED IN MAXIMUM 8" LOOSE LIFTS FOR HEAVY EQUIPMENT AND 4" LOOSE LIFTS FOR HAND-DIRECTED EQUIPMENT. THE LOWER PORTION OF THE COMPACTED BACKFILL MAY CONSIST OF SOIL REMOVED FROM THE FOUNDATION AREA THAT IS FREE OF CONSTRUCTION DEBRIS, ORGANIC AND OTHER DELETERIOUS MATERIAL. COMPACT TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 (STANDARD PROCTOR), AND AT A MOISTURE CONTENT WITHIN 1 PERCENT BELOW TO 4 PERCENT ABOVE OPTIMUM MOISTURE. THE UPPER 3'-0" OF SELECT FILL SHALL BE CLASS 4 EARTH FILL COMPACTED TO A MINIMUM OF 98 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 (STANDARD PROCTOR), AND AT A MOISTURE CONTENT WITHIN 2 PERCENT BELOW TO 3 PERCENT ABOVE OPTIMUM MOISTURE.
   E. IN-PLACE FIELD DENSITY TESTS SHALL BE CONDUCTED AT A RATE OF ONE TEST PER 5,000 SQUARE FEET FOR EACH LIFT WITH A MINIMUM OF 3 TESTS PER LIFT. EACH LIFT SHALL BE COMPACTED, TESTED, AND APPROVED BEFORE ANOTHER LIFT IS PLACED. ANY AREA FOUND NOT TO COMPLY WITH COMPACTION REQUIREMENTS SHALL BE REWORKED AND RETESTED.
   F. THE SUBGRADE MOISTURE CONTENT AND DENSITY SHALL BE MAINTAINED DURING CONSTRUCTION.

3. DO NOT BACKFILL FOUNDATION OR WALLS UNTIL THE CONCRETE HAS REACHED ITS SPECIFIED 28-DAY COMPRESSIVE STRENGTH OR 7 DAYS, WHICHEVER IS LONGER, OR UNTIL THE RESTRAINING SLABS OR ADEQUATE BRACING ARE IN PLACE.

4. GRADING AROUND STRUCTURES SHALL PROVIDE SURFACE DRAINAGE AWAY FROM STRUCTURES (2 PERCENT MINIMUM SLOPE).

5. DESIGN BEARING PRESSURE (NET) IS 2500 PSF FOR FOUNDATIONS BEARING ON UNDISTURBED FIRM SOIL OR APPROVED ENGINEERED FILL MATERIAL. SUITABLE BEARING MATERIALS SHALL BE VERIFIED BY A LICENSED PROFESSIONAL GEOTECHNICAL ENGINEER.

POST-INSTALLED ANCHORS (EXPANSION OR ADHESIVE)

1. INSTALL IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII), BUT NOT LESS THAN THAT INDICATED BELOW.

2. ADHESIVE ANCHORS SHALL ONLY BE INSTALLED BY CONSTRUCTION PERSONNEL CERTIFIED UNDER ACI/CRSI ADHESIVE ANCHOR INSTALLER CERTIFICATION PROGRAM OR APPROVED EQUAL. SUBMIT CERTIFICATIONS AS RECORD DATA.

3. ANCHOR DIAMETER AND EMBEDMENT SHALL BE AS INDICATED.

4. HOLES SHALL BE DRILLED USING ROTARY HAMMER DRILLS WITH ANSI MATCHED TOLERANCE CARBIDE-TIPPED DRILL BITS. DRILL BIT DIAMETER SHALL MATCH DIAMETER RECOMMENDED BY MANUFACTURER.

5. USE CARE AND CAUTION WHEN INSTALLING TO AVOID CUTTING OR DAMAGING EXISTING REINFORCING STEEL. FIELD VERIFY EXISTING REINFORCING LOCATIONS PRIOR TO FABRICATION OR CONSTRUCTION, AND THEN COORDINATE REBAR LOCATIONS WITH SHOP DRAWINGS.

6. AS INDICATED BLOW HOLES CLEAN WITH CLEAN COMPRESSED AIR, 90 PSI MINIMUM. START BLOWING WITH NOZZLE AT BACK OF HOLE AND SLOWLY EXTRACT NOZZLE. AS AN ALTERNATE TO BRUSHING AND/OR BLOWING HOLES CLEAN, DRILL HOLES USING HILTI SAFESET TECHNOLOGY OR APPROVED EQUAL.

7. EXPANSION ANCHORS SHALL BE A STUD BOLT TYPE WITH HEX HEAD NUT AND SHALL BE 316 STAINLESS STEEL, UNLESS NOTED OTHERWISE, AND AS NOTED BELOW:
   A. ANCHORS SHALL BE HILTI KWIK BOLT TZ, OR AN APPROVED EQUAL. SUBMIT PUBLISHED COMPARISONS BETWEEN EACH SPECIFIED AND EACH ALTERNATE ANCHOR.
   B. BLOW HOLES CLEAN. REPEAT 3 TIMES.
   C. DRIVE ANCHOR INTO HOLE WITH A HAMMER AND THEN TIGHTEN TO SPECIFIED TORQUE.

8. ADHESIVE ANCHORS SHALL BE DEFORMED REINFORCING BARS, ASTM A615, GR 60 OR 316 STAINLESS STEEL THREADED ROD, UNLESS NOTED OTHERWISE, AND AS NOTED BELOW:
   A. ADHESIVE SHALL BE HILTI HIT-RE 500 V3 OR AN APPROVED EQUAL. USE HILTI HIT-HY 270 FOR HOLLOW OR GROUTED MASONRY OR AN APPROVED EQUAL. SUBMIT PUBLISHED COMPARISONS BETWEEN EACH SPECIFIED AND EACH ALTERNATE ANCHOR.
   B. PRIOR TO INSTALLATION: ALL DEFORMED BARS AND THREADED ROD SHALL BE CLEAN, FREE OF OIL, GREASE, OR OTHER RESIDUE, IN ACCORDANCE WITH MPII.
   C. CLEAN HOLES BEFORE INSTALLING ANCHOR PER MPII, BUT NOT LESS THAN THE FOLLOWING:
      i. BLOW HOLE CLEAN. REPEAT 3 TIMES.
      ii. BRUSH HOLE WITH SPECIFIED BRUSH. REPEAT 3 TIMES.
      iii. BLOW HOLE CLEAN. REPEAT 3 TIMES.
   D. INSTALL EPOXY STARTING AT BACK OF HOLE. AS REQUIRED BY MPII, USE MANUFACTURER SUPPLIED PISTON PLUG INJECTION SYSTEM FOR ALL HORIZONTAL AND VERTICALLY INCLINED HOLES.
   E. INSTALL ANCHOR BY SIMULTANEOUSLY TWISTING AND INSERTING INTO HOLE.
   F. ALLOW ANCHOR TO SET REQUIRED TIME. DO NOT DISTURB.
   G. TIGHTEN NUT. DO NOT OVER-TORQUE.
   H. MINIMUM CONCRETE AGE AT TIME OF INSTALLATION: 28 DAYS
   I. CONCRETE TEMPERATURE RANGE AT TIME OF INSTALLATION SHALL BE: 41DEG F TO 104DEG F.
   J. CONCRETE MOISTURE CONDITION AT TIME OF INSTALLATION: DRY.

ALUMINUM

1. ALUMINUM CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE ALUMINUM CONSTRUCTION MANUAL OF THE ALUMINUM ASSOCIATION.

2. UNLESS OTHERWISE INDICATED, STRUCTURAL ALUMINUM SHALL BE ALLOY 6061-T6 AS SPECIFIED IN ASTM B308, EXCEPT RAILINGS WHICH SHALL BE 6063-T6.

3. ALUMINUM IN CONTACT WITH OR EMBEDDED IN CONCRETE OR MASONRY SURFACES SHALL BE COATED WITH A ZINC CHROMATE SYSTEM.

4. ALL BOLTS USED IN CONNECTION WITH ALUMINUM MEMBERS SHALL BE STAINLESS STEEL 316, UNLESS NOTED OTHERWISE.

5. ALL WELDING OF ALUMINUM STRUCTURES SHALL CONFORM TO "STRUCTURAL WELDING CODE - ALUMINUM", LATEST AWS D1.2 AND REVISIONS.

STRUCTURAL MODIFICATIONS

1. REFER TO OTHER DISCIPLINE DRAWINGS FOR RELOCATION AND DEMOLITION OF PIPING, CONDUITS, FIXTURES, INSTRUMENTS, ETC. ASSOCIATED WITH STRUCTURES SHOWN TO BE DEMOLISHED.

2. ALL DEMOLITION, REMOVAL AND CONSTRUCTION ACTIVITIES SHALL BE CONDUCTED WITH CONSIDERATION FOR EXISTING FACILITIES STRUCTURES, EQUIPMENT, ETC. ANY DAMAGE WHICH MAY OCCUR BEYOND DESCRIBED DEMOLITION AND CONSTRUCTION SHALL BE REMEDIED AT CONTRACTOR'S EXPENSE AND OWNER/ENGINEER NOTIFIED.

3. CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL DEMOLISHED CONCRETE AND OTHER MATERIALS FROM THE EXISTING STRUCTURES OFF SITE PRIOR TO THE NEW CONSTRUCTION.

4. UNLESS OTHERWISE NOTED ON PLANS, CUTTING EMBEDDED REBARS DUE TO PIPING, CONDUITS OR ANY OTHER PENETRATION THROUGH EXISTING CONCRETE STRUCTURE IS PROHIBITED. CONTRACTOR SHALL DETECT THE EXISTING REBAR LOCATIONS BY NONDESTRUCTIVE TESTING METHODS AND KEEP PENETRATION AWAY FROM THE EMBEDDED REBARS.

5. WHERE REMOVING EXISTING CONCRETE BUT RETAINING REBARS IS INDICATED ON DRAWINGS, SAWCUT EXISTING CONCRETE TO THE LIMITS SHOWN ON PLANS BUT NOT MORE THAN 3/4" DEEP TO AVOID DAMAGING OR NICKING THE REINFORCING.

6. WHERE DEMOLITION OF EXISTING CONCRETE WILL LEAVE EMBEDDED EXISTING REBARS EXPOSED, AN ADDITIONAL 1-1/2" CONCRETE AND REINFORCEMENT BEYOND LIMITS OF THE DEMOLITION SHALL BE REMOVED. THE 1-1/2" AREAS BEING REMOVED SHALL THEN BE PLACED BACK WITH CONCRETE STRUCTURAL REPAIR MATERIAL AS SPECIFIED TO PROVIDE CORROSION PROTECTION FOR THE EXPOSED EXISTING REBARS, UNLESS OTHERWISE NOTED ON PLAN.

7. ROUGHEN THE EXISTING CONCRETE SURFACES THAT WILL ENCOUNTER NEW CONCRETE. "ROUGHENED SURFACE" SHALL HAVE A UNIFORMLY ROUGHENED CONCRETE SURFACE TO A FULL AMPLITUDE (DISTANCE BETWEEN HIGH AND LOW POINTS OR SIDE TO SIDE) OF APPROXIMATELY 1/4" WITH SUITABLE TOOLS TO EXPOSE A FRESH FACE. APPLY BONDING AGENT TO THE EXISTING CONCRETE SURFACES PRIOR TO THE PLACEMENT OF NEW CONCRETE PER MANUFACTURER'S INSTRUCTIONS.

8. ALL EXPOSED EXISTING REBARS SHALL BE CLEANED BY ABRASIVE BLASTING AND COATED WITH AN EPOXY RESIN/PORTLAND CEMENT ADHESIVE BONDING AGENT TO PROVIDE CORROSION PROTECTION.

IBC CHAPTER 17 SPECIAL INSPECTION REQUIREMENTS

1. THE OWNER OR THE OWNER'S REPRESENTATIVE IS REQUIRED TO PERFORM SPECIAL INSPECTIONS IN ACCORDANCE WITH THE 2015 IBC AND AS OUTLINED IN THE STATEMENT OF SPECIAL INSPECTION.

2. THE CONTRACTOR IS REQUIRED TO ENABLE THE ABOVE INSPECTIONS TO OCCUR BY PROVIDING ACCESS TO THE ELEMENTS REQUIRING INSPECTION. IN ADDITION, THE CONTRACTOR SHALL PROVIDE 48 HOURS ADVANCED NOTICE TO THE OWNER OR THE OWNER'S REPRESENTATIVE REGARDING ALL CONSTRUCTION ACTIVITIES RELATED TO AND/OR AFFECTING THE REQUIRED SPECIAL INSPECTIONS.

ISSUED FOR BID

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

STATE OF TEXAS
MICHAEL RAY ROBERTSON
59701
LICENSED
PROFESSIONAL ENGINEER
01/28/2022

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS

GENERAL

STRUCTURAL NOTES

F&N JOB NO.	BMT21704
DATE	01/28/2022
DESIGNED	MRR
DRAWN	JLM
REVISED	-
CHECKED	PAB
FILE NAME	ST-BMT-GN-NOTE.dwg

NO.	ISSUE	BY	DATE

Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

VERIFY SCALE 0 1

SHEET G-3

SEQ. 3

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PIPING, VALVE, AND EQUIPMENT SYMBOLS

DOUBLE LINE / SINGLE LINE

- 90° BEND
- CROSS
- TEE
- 90° BEND TURNING AWAY
- 90° BEND TURNING TOWARD
- REDUCER OR INCREASER (OR)
- STRAINER
- UNION
- BLIND FLANGE, CAP, OR PLUG (OR)
- SOLENOID OPERATED PUMP CONTROL VALVE
- KNIFE GATE
- SLIDE GATE
- GATE VALVE
- GLOBE VALVE
- BALL VALVE
- CHECK VALVE
- PLUG VALVE
- BUTTERFLY VALVE
- NEEDLE VALVE
- THREE-WAY VALVE
- PINCH VALVE
- SELF ACTUATING PRESSURE REGULATING VALVE
- PRESSURE RELIEF VALVE
- BACK PRESSURE VALVE
- BACK PRESSURE/ANTI SIPHON VALVE
- SPRING LOADED RELIEF VALVE
- SOLENOID OPERATED VALVE
- MOTOR OPERATED VALVE
- MOTOR-ARROW DENOTES VARIABLE SPEED
- MOTOR
- MAGNETIC FLOW METER
- THERMOMETER
- PULSATION DAMPER ASSEMBLY
- PRESSURE GAUGE (OR)
- EXPANSION CHAMBER ASSEMBLY
- UTILITY STATION
- FIRE EXTINGUISHER
- HOISTING HOOK
- DRAIN
- CALIBRATION CHAMBER
- TEMPERATURE INDICATOR
- PRESSURE DIFFERENTIAL INDICATOR
- CHEMICAL FEED POINT
- AIR RELEASE VALVE
- PUMP
- CHOPPER
- HOSE PUMP
- CENTRIFUGAL PUMP CONSTANT SPEED
- CENTRIFUGAL PUMP VARIABLE SPEED
- BLOWER
- VERTICAL TURBINE PUMP
- PROGRESSING CAVITY PUMP
- METERING PUMP
- HEAT TRACING
- MIXER
- FLOATS
- SONIC
- TELESCOPING VALVE
- QUICK CONNECTOR
- HOSE BIBB
- CLEAN OUT
- WATER SURFACE ELEVATION (OR)
- FIRE HYDRANT
- LIGHTING STANDARD
- MANHOLE
- WATER STOP
- FLOW ARROW
- PRESSURE SWITCH
- FLEXIBLE COUPLING
- FLEXIBLE HOSE
- PIPE COUPLING
- RESTRAINED EXPANSION JOINT
- DIRECTION OF FLOW
- EXPANSION JOINT
- GAS FILTER
- VENT
- CHEMICAL SEAL
- SCREEN
- EJECTOR
- PRIMARY ELEMENT
- VENTURI FLOWMETER

PROCESS FLOW STREAM - INDEX

PROCESS CODE	PRODUCT - SERVICE
AD	AIR DUCT
AL	ALUM
AM	AMMONIA LIQUID
ASD	AMMONIA SCRUBBER DUCT
BW	BACKWASH WATER
BWD	BACKWASH DECANT
BWW	BACKWASH WASTE
BYP	BYPASS
CAD	COMPRESSED AIR - DRIED
CLG	CHLORINE GAS (PRESSURE)
CLL	CHLORINE LIQUID
CLS	CHLORINE SOLUTION
CLV	CHLORINE GAS VACUUM
CR	CAUSTIC RECIRCULATION
CS	CHEMICAL STORAGE
CSD	CHLORINE SCRUBBER DUCT
DW	DISTRIBUTION WATER
F	FLUORIDE
FE3	FERRIC SULFATE
FI	FILTER INFLUENT
FM	FORCE MAIN
FSW	FILTER SURFACE WASH
FTW	FILTERED WATER
LPA	LOW PRESSURE AIR
LS	LIME SLURRY
NPW	NON POTABLE WATER
OCWR	OZONE COOLING WATER RETURN
OCWS	OZONE COOLING WATER SUPPLY
OW	OZONED WATER
OZ	OZONE GAS
P	POLYMER
PAC	POWDERED ACTIVATED CARBON SLURRY
PD	PLANT DRAIN (PUMPED)
PW	POTABLE WATER
RW	RAW WATER
SC	SODIUM CHLORITE
SL	SLUDGE
SH	CAUSTIC SODA (SODIUM HYDROXIDE)
SPL	SAMPLE LINE
SP	SUMP PUMP
SS	SANITARY SEWER
STW	SETTLED WATER
SW	SERVICE WATER
TR	THICKENER RECYCLE
UW	UTILITY WATER
WBW	WASTE BACKWASH WATER
WR	WASHWATER RECYCLE
VT	VENT

MATERIALS IN PLAN/SECTION

- CONCRETE (PLAN OR SECTION)
- CHECKERED PLATE (PLAN)
- EARTH (SECTION)
- GRATE (PLAN)
- GRATE (SECTION)
- GROUT (SECTION)
- OPENING OR DEPRESSION IN SLAB OR WALL (PLAN OR SECTION)

PIPING MATERIAL INDEX

DESCRIPTION	CODE
BLACK STEEL PIPE	BS
CAST IRON PIPE	CI
CAST-IN-PLACE CONCRETE TUNNEL	CIPT
CENTRIFUGALLY CAST FIBERGLASS REINFORCED POLYMER MORTAR PIPE	CCFRPM
COPPER	CU
CHLORINATED POLYVINYL CHLORIDE	CPVC
DUCTILE IRON PIPE	DI
FIBER REINFORCED PLASTIC	FRP
PRESTRESSED CONCRETE CYL PIPE (C301)	PCC
POLYETHYLENE PIPE	PE
POLYPROPYLENE	PP
POLYVINYL CHLORIDE PIPE	PVC
REINFORCED CONCRETE	RC
BAR WRAPPED CONC. CYL PIPE (C-303)	RCC
RUBBER HOSE	RH
STEEL PIPE	S
STAINLESS STEEL PIPE	SS
VITRIFIED CLAY	VC

IDENTIFICATION SYMBOLOGY

PIPING

8 - PW - DI

- 8 — NOMINAL LINE SIZE IN INCHES
- PW — PROCESS FLOW STREAM
- DI — PIPE MATERIAL

LINETYPE SYMBOLS

- NEW EQUIPMENT, PIPING, OR STRUCTURES
- FUTURE EQUIPMENT, PIPING, OR STRUCTURES
- EXISTING PIPING, OR STRUCTURES
- ITEMS TO BE REMOVED AND DISPOSED OF
- HANDRAIL
- EXISTING FENCE
- 240 — EXISTING GRADE CONTOUR
- 240 — FINISH GRADE CONTOUR
- 3:1 — SLOPE (3 HORIZ TO 1 VERT)
- EXISTING MANHOLE
- UG — EXISTING UNDERGROUND GAS
- UGE — EXISTING UNDERGROUND ELECTRIC LINE
- NPW — EXISTING NON POTABLE WATER LINE
- OHE — EXISTING OVERHEAD ELECTRIC LINE
- PD — EXISTING PLANT DRAIN
- CENTERLINE
- MATCHLINE
- BREAKLINE
- EXISTING (SCREENED)
- NEW (BOLD)

GENERAL SYMBOLOGY

PLAN OR SECTION NUMBER / DESCRIPTION

X / XXX — XX SCALE — IF SAME IN PLAN

PLAN OR SECTION NUMBER / DESCRIPTION

X / XXX — XX SCALE — SHEET NUMBER TAKEN FROM

PLAN AND SECTION

ARROW INDICATES DIRECTION OF SECTION CUT

SECTION NUMBER

X / XXX — SHEET NUMBER TAKEN FROM

SECTION

ARROW INDICATES POINT OF VIEW

ELEVATION NUMBER

X / XXX — SHEET NUMBER TAKEN FROM

ELEVATION OR PHOTO MARKER

DETAIL NUMBER

X / XXX — SHEET NUMBER TAKEN FROM

DETAIL REFERENCE

NOTE:

1. SYMBOLS REPRESENT NEW OR EXISTING STRUCTURES, LINES AND WORK. NEW WORK IS DISTINGUISHED FROM EXISTING WITH BOLD VERSUS SCREENED LINE.
2. THIS IS A STANDARD LEGEND. THEREFORE, NOT ALL OF THIS INFORMATION MAY BE USED ON THIS PROJECT.

ISSUED FOR BID

Freese and Nichols, Inc
Texas Registered Engineering Firm F-2144

STATE OF TEXAS — 118309 — LICENSED PROFESSIONAL ENGINEER — 02-01-2022

FREESE NICHOLS

11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
GENERAL

STANDARD SYMBOLS & LEGEND

F&N JOB NO.	BMT21704
DATE	01/28/2022
DESIGNED	RT
DRAWN	JG
REVISED	-
CHECKED	MM

NO.	ISSUE	BY	DATE

FILE NAME GN-ALL-PL-LGND.dwg

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SHEET G-4

SEQ. 4

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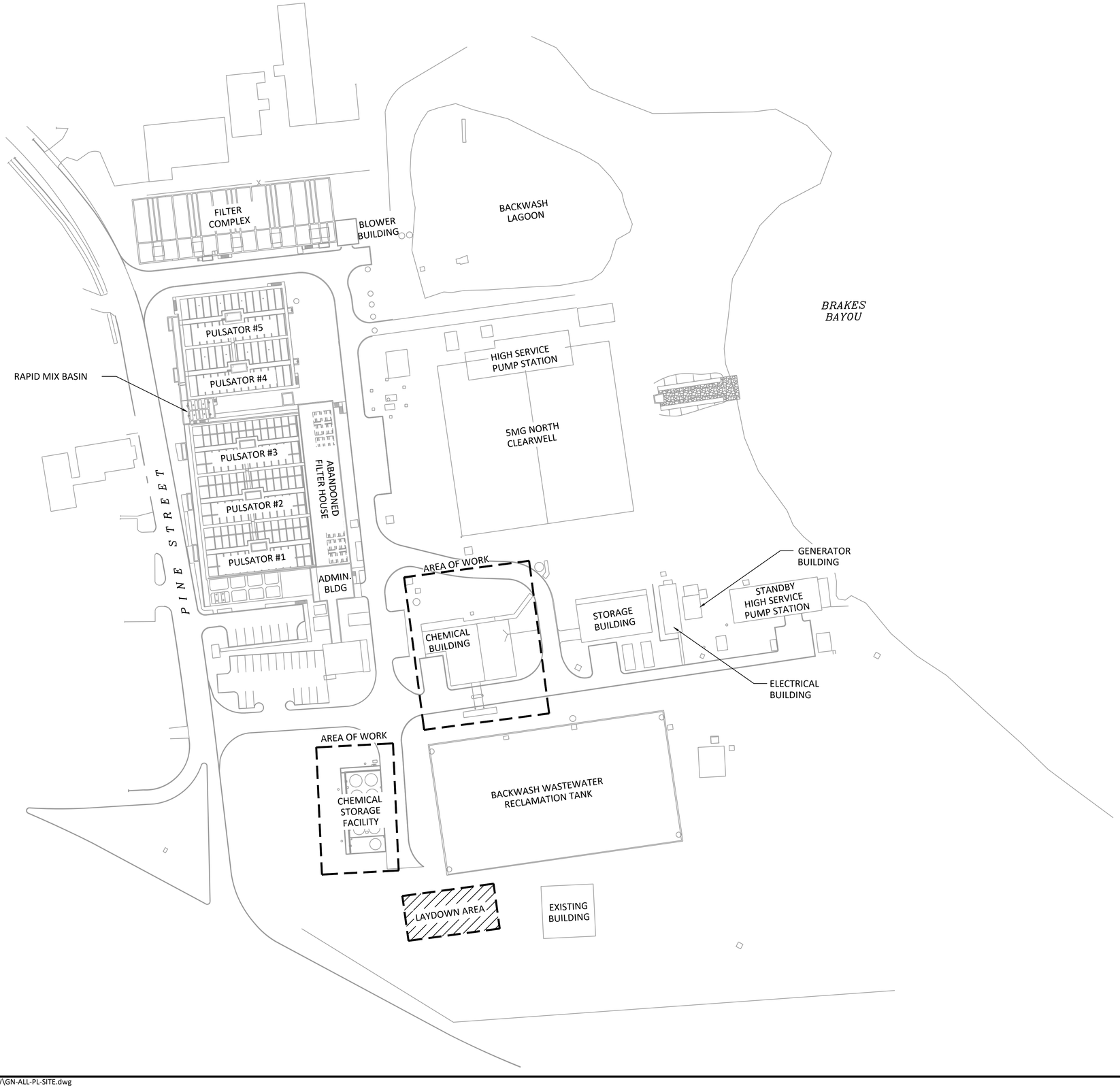

ISSUED FOR BID

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

STATE OF TEXAS
JONNATH CHILUKURI
118309
LICENSED
PROFESSIONAL ENGINEER
02-01-2022

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
GENERAL
EXISTING SITE PLAN

NO.	ISSUE	BY	DATE

F&N JOB NO. BMT21704
DATE 01/28/2022
DESIGNED RT
DRAWN JG
REVISED -
CHECKED MM
FILE NAME GN-ALL-PL-SITE.dwg

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1"

SHEET G-5
SEQ. 5

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ABBREVIATIONS

ABBR	DESCRIPTION
AS	AIR SUPPLY
AFD	ADJUSTABLE FREQUENCY DRIVE
CPU	CENTRAL PROCESSOR UNIT
DCU	DISTRIBUTED CONTROL UNIT
ES	ELECTRIC SUPPLY
FOC	FIBER OPTIC CABLE
FOM	FIBER OPTIC MODEM
FREQ	FREQUENCY
FV	FLOW CONTROL VALVE
HDC	HISTORICAL DATA COLLECTION
I/O	INPUT OUTPUT
MC	MOTOR CONTROLLER
ORP	OXYGEN REDUCTION POTENTIAL
OWS	OPERATOR WORK STATION
PE	PRESSURE SENSOR
PIT	PRESSURE INDICATOR TRANSMITTER
PLC	PROGRAMMABLE LOGIC CONTROLLER
PS	POWER SUPPLY
PSH	PRESSURE SWITCH HIGH
PSL	PRESSURE SWITCH LOW
PW	PROCESS WATER
RIO	REMOTE INPUT OUTPUT
RTU	REMOTE TERMINAL UNIT
SE	SPEED SENSOR
SIK SL	PEED INDICATE CONTROL STATION
SP	SLUDGE
SS	SET POINT
SSRVS	SOFT STARTER
VLV	SOLID STATE REDUCED VOLTAGE STARTER VALVE (MANUAL AND NO CONTROLS)

HAND SWITCH ABBREVIATIONS

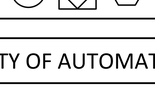
ABBR	DESCRIPTION
H/O/A	HAND/OFF/AUTO
L/R	LOCAL/REMOTE
H/O/S	HAND/OFF/SCADA
O/C	OPEN/CLOSE
L/O/C	LOCAL/OFF/COMPUTER
A/H	AUTO/HAND
L/O/R	LOCAL/OFF/REMOTE
L/A	LOCAL/AUTO
O/C/S	OPEN/CLOSE/STOP
O/O/A	ON/OFF/AUTO
L/C	LOCAL/COMPUTER
N/B	NORMAL/BYPASS

INSTRUMENT IDENTIFICATION

	PRIMARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR (2)	FIELD MOUNTED	AUXILIARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR (2)
DISCRETE INSTRUMENTS			
SHARED DISPLAY SHARED CONTROL			
COMPUTER FUNCTION			
PROGRAMMABLE LOGIC CONTROL			
		INSTRUMENT WITH LONG TAG NUMBERS	INSTRUMENTS SHARING COMMON HOUSING
	PILOT LIGHT	PANEL MOUNTED PATCHBOARD POINT 12 (G 12)	PURGE OR FLUSING DEVICE (P)
	RESET FOR LATCH-TYPE ACTUATOR (R)	DIAPHRAGM SEAL	UNDEFINED INTERLOCK LOGIC (I)

(1) ABBREVIATIONS OF THE USER'S CHOICE SUCH AS IP1 (INSTRUMENT PANEL NO.1), IC2 (INSTRUMENT CONSOLE NO.2), CC3 (COMPUTER CONSOLE NO.3), ETC., MAY BE USED WHEN IT IS NECESSARY TO SPECIFY INSTRUMENT OR FUNCTION LOCATION.

(2) NORMALLY INACCESSIBLE OR BEHIND-THE-PANEL DEVICES OR FUNCTIONS MAY BE DEPICTED BY USING THE SAME SYMBOLS BUT WITH DASHED HORIZONTAL BARS, I.E.



GENERAL NOTES

(1) THE FOLLOWING ABBREVIATIONS ARE SUGGESTED TO DENOTE THE TYPES OF POWER SUPPLY. THESE DESIGNATIONS MAY ALSO BE APPLIED TO PURGE FLUID SUPPLIES.

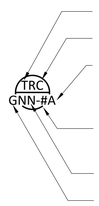
AS - AIR SUPPLY
HS - HYDRAULIC SUPPLY - OPTION
IA - INSTRUMENT AIR - OPTION
NS - NITROGEN SUPPLY
PA - PLANT AIR
SS - STEAM SUPPLY
ES - ELECTRIC SUPPLY
WS - WATER SUPPLY
GS - GAS SUPPLY

THE SUPPLY LEVEL MAY BE ADDED TO THE INSTRUMENT SUPPLY LINE, E.G, AS-100, 100-PSIG AIR SUPPLY: ES-24DC, A 24-VOLT DIRECT CURRENT POWER SUPPLY.

(2) THE PNEUMATIC SIGNAL SYMBOL APPLIES TO A SIGNAL USING ANY GAS AS THE SIGNAL MEDIUM. IF A GAS OTHER THAN AIR IS USED, THE GAS MAY BE IDENTIFIED BY A NOTE ON THE SIGNAL SYMBOL OR OTHERWISE.

(3) ELECTROMAGNETIC PHENOMENA INCLUDE HEAT, RADIO WAVES, NUCLEAR RADIATION AND LIGHT.

EXAMPLE SIGNALS

SYMBOL	DESCRIPTION
	FIRST LETTER IN EQUIPMENT CODE SUCCEEDING LETTERS DIFFERENTIAL LETTER (USED WHEN THERE ARE MULTIPLE UNITS WITH THE SAME GNNN# DESIGNATIONS) UNIT NUMBER (#) PROCESS FUNCTION/LOOP NUMBER (NNN) PROCESS CODE (G)
	DIGITAL SYSTEM I/O INTERFACE. DIRECTION OF TRIANGLE DENOTES WHETHER INPUT OR OUTPUT. LETTER DENOTES SIGNAL TYPE. THE LETTER "A" DENOTES AN ANALOG SIGNAL. THE LETTER "D" DENOTES A DISCRETE SIGNAL.

LINE TYPES

SYMBOL	DESCRIPTION
	INSTRUMENT SUPPLY OR SOLENOID OPERATED VALVE (1)
	UNDEFINED SIGNAL
	PNEUMATIC SIGNAL (2)
	ELECTRIC SIGNAL
	HYDRAULIC SIGNAL
	CAPILLARY TUBE
	ELECTROMAGNETIC OR SONIC, SIGNAL (GUIDED) (3)
	ELECTROMAGNETIC OR SONIC, SIGNAL (NOT GUIDED) (3)
	INTERNAL SYSTEM LINK (SOFTWARE OR DATA LINK)
	MECHANICAL LINK
	PNEUMATIC BINARY SIGNAL (ON-OFF)
	ELECTRIC BINARY SIGNAL (ON-OFF)
A	ELECTRIC ANALOG SIGNAL
	NON-CONNECTING LINES
	CONNECTING LINES

NOTE:
THIS IS A STANDARD LEGEND. THEREFORE, NOT ALL OF THIS INFORMATION MAY BE USED ON THIS PROJECT.

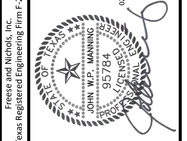
INTERNATIONAL SOCIETY OF AUTOMATION TABLE

	FIRST LETTER (S)		SUCCEEDING LETTERS		
LETTER	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS (+)		ALARM		
B	BURNER, COMBUSTION		USERS CHOICE (+)	USERS CHOICE (+)	USERS CHOICE (+)
C	USER'S CHOICE (+)			CONTROL	
D	USER'S CHOICE (+)	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE (+)		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOTOR	MOMENTARY			MIDDLE, INTERMEDIATE
N	USERS CHOICE (+)		USERS CHOICE (+)	USERS CHOICE (+)	USERS CHOICE (+)
O	USERS CHOICE (+)		ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION (+)
V	VIBRATION MECH. ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED (+)	X AXIS	UNCLASSIFIED	UNCLASSIFIED (+)	UNCLASSIFIED (+)
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

(+) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL. SEE ABBREVIATIONS AND LETTER SYMBOLS.

ISSUED FOR BID

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144



FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
PROCESS & INSTRUMENTATION

LEGEND

F&N JOB NO. BMT21704
DATE 01/28/2022
DESIGNED HW
DRAWN HW
REVISED -
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FILE NAME PI-ALL-GN-LGND_FI.dwg

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SHEET G-PI-1
SEQ. 6

ACAD Rel: 24.0s (LMS Tech)
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Plot Date: 2/1/2022 9:26 AM Plot By: 02789 Filename: N:\PI\#1 - FLOOD IMPROVEMENTS\PI-ALL-GN-LGND_FI.dwg

SOLENOID OPERATED PUMP CONTROL VALVE

SOLENOID

KNIFE GATE

SLIDE GATE

GATE VALVE

GLOBE VALVE

BALL VALVE

PLUG VALVE

CHECK VALVE

DOUBLE CHECK VALVE

BUTTERFLY VALVE

NEEDLE VALVE

THREE-WAY VALVE

PINCH VALVE

MUD VALVE

SELF ACTUATING PRESSURE REGULATING VALVE

PRESSURE RELIEF VALVE

BACK PRESSURE VALVE

BACK PRESSURE/ANTI SIPHON VALVE

SPRING LOADED RELIEF VALVE

SOLENOID OPERATED VALVE

MOTOR OPERATED VALVE

MOTOR-ARROW DENOTES VARIABLE SPEED

MOTOR

ELECTROMAGNETIC FLOW METER

THERMAL MASS FLOW METER

VENTURI FLOW METER

PRESSURE GUAGE WITH DIAPHRAGM SEAL

THERMOMETER

PULSATION DAMPER ASSEMBLY

PRESSURE GAUGE

EXPANSION CHAMBER ASSEMBLY

PRESSURE SWITCH

UTILITY STATION

FIRE EXTINGUISHER

HOISTING HOOK

DRAIN

CALIBRATION CHAMBER

TEMPERATURE INDICATOR

PRESSURE DIFFERENTIAL INDICATOR

CHEMICAL FEED POINT

DIAPHRAGM SEAL

PRIMARY ELEMENT

METERING PUMP

CHOPPER

HOSE PUMP

CENTRIFUGAL PUMP CONSTANT SPEED

CENTRIFUGAL PUMP VARIABLE SPEED

BLOWER

SUBMERSIBLE PUMP

SUBMERSIBLE CHOPPER PUMP

SUMP PUMP

ROTARY LOBE PUMP

RECIPROCATING PUMP

VERTICAL TURBINE PUMP

PROGRESSING CAVITY PUMP

CENTRIFUGE

FINE BUBBLE DIFFUSERS

AIR RELEASE VALVE

COMBINATION AIR VALVE

HOSE BIB

Y-STRAINER

STRAINER

FLEXIBLE COUPLING

BLIND FLANGE

PIPE COUPLING

RESTRAINED EXPANSION JOINT

EXPANSION JOINT

EXPANSION JOINT

GAS FILTER

VENT

SCREEN

EJECTOR

PRIMARY ELEMENT

TELESCOPING VALVE

DAHL FLOW TUBE

MIXER

FLOATS

TREATMENT PROCESS LINE

FOUL AIR LINE

DRAIN LINE

QUICK CONNECTOR

REDUCER OR INCREASER

BLIND FLANGE, CAP, OR PLUG

UNION

HOSE BIBB

CLEAN OUT

WATER SURFACE ELEVATION

FIRE HYDRANT

LIGHTING STANDARD

MANHOLE

WATER STOP

FLOW ARROW

DIRECTION OF FLOW

TYPE

SONIC

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

STATE OF TEXAS
JOHN W.P. MANNING
95784
LICENSED PROFESSIONAL ENGINEER
10/31/22

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
PROCESS & INSTRUMENTATION

LEGEND II

NO.	ISSUE	BY	DATE

F&N JOB NO. BMT21704
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0 1

SHEET G-PI-2
SEQ. 7

ISSUED FOR BID

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Last Saved: 12/9/2021 1:39 PM Saved By: 02789

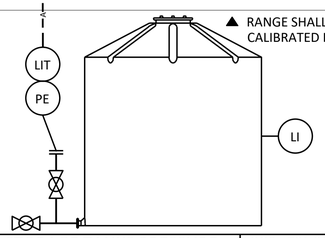
Plot Date: 2/1/2022 9:26 AM Plot By: 02789 Filename: N:\PI\#1 - FLOOD IMPROVEMENTS\PI-ALL-GN-LGND02.dwg

TAG #	DESCRIPTION	RANGE	SIGNAL
PE/LIT-701-01	EXISTING ALUM TANK LEVEL	▲	4-20mA
PE/LIT-701-02	EXISTING ALUM TANK LEVEL	▲	4-20mA
PE/LIT-701-03	EXISTING ALUM TANK LEVEL	▲	4-20mA
PE/LIT-701-04	EXISTING ALUM TANK LEVEL	▲	4-20mA
PE/LIT-701-05	EXISTING ALUM TANK LEVEL	▲	4-20mA
PE/LIT-701-06	EXISTING FLUORIDE TANK LEVEL	▲	4-20mA
PE/LIT-701-07	EXISTING AMMONIA TANK LEVEL	▲	4-20mA
PE/LIT-701-08	CAUSTIC TANK LEVEL	▲	4-20mA
PE/LIT-701-09	CAUSTIC TANK LEVEL	▲	4-20mA
PE/LIT-701-11	CAUSTIC TANK LEVEL	▲	4-20mA

OWS

PLC

FIELD



▲ RANGE SHALL BE FIGURED AND CALIBRATED IN FIELD

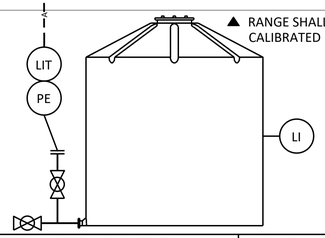
CHEMICAL STORAGE TANKS PRESSURE TRANSMITTER — LOOP : 701-01-09, 11

TAG #	DESCRIPTION	RANGE	SIGNAL
PE/LIT-702-01	POLYMER TANK LEVEL	▲	4-20mA

OWS

PLC

FIELD



▲ RANGE SHALL BE FIGURED AND CALIBRATED IN FIELD

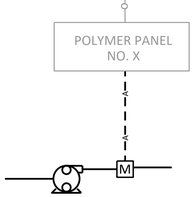
POLYMER STORAGE TANKS LEVEL TRANSMITTER — LOOP : 702-01

TAG #	DESCRIPTION	RANGE	SIGNAL

OWS

PLC

FIELD



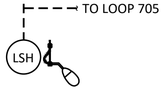
POLYMER SYSTEM FLOW METER AND PUMP (TYP OF 2) — LOOP : 706-01, 02

TAG #	DESCRIPTION	RANGE	SIGNAL

OWS

PLC

FIELD



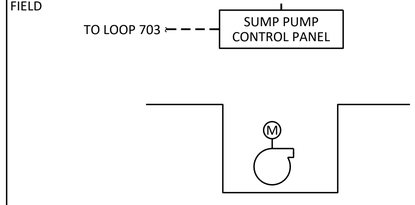
CONTAINMENT AREA HIGH LEVEL FLOAT — LOOP : 703-10, 11

TAG #	DESCRIPTION	RANGE	SIGNAL

OWS

PLC

FIELD



CONTAINMENT AREA SUMP PUMP — LOOP : 705-06, 07

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Texas Registered Engineering Firm F-2144

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
PROCESS & INSTRUMENTATION

LOOP DIAGRAMS I

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0 1"

SHEET G-PI-3
SEQ. 8

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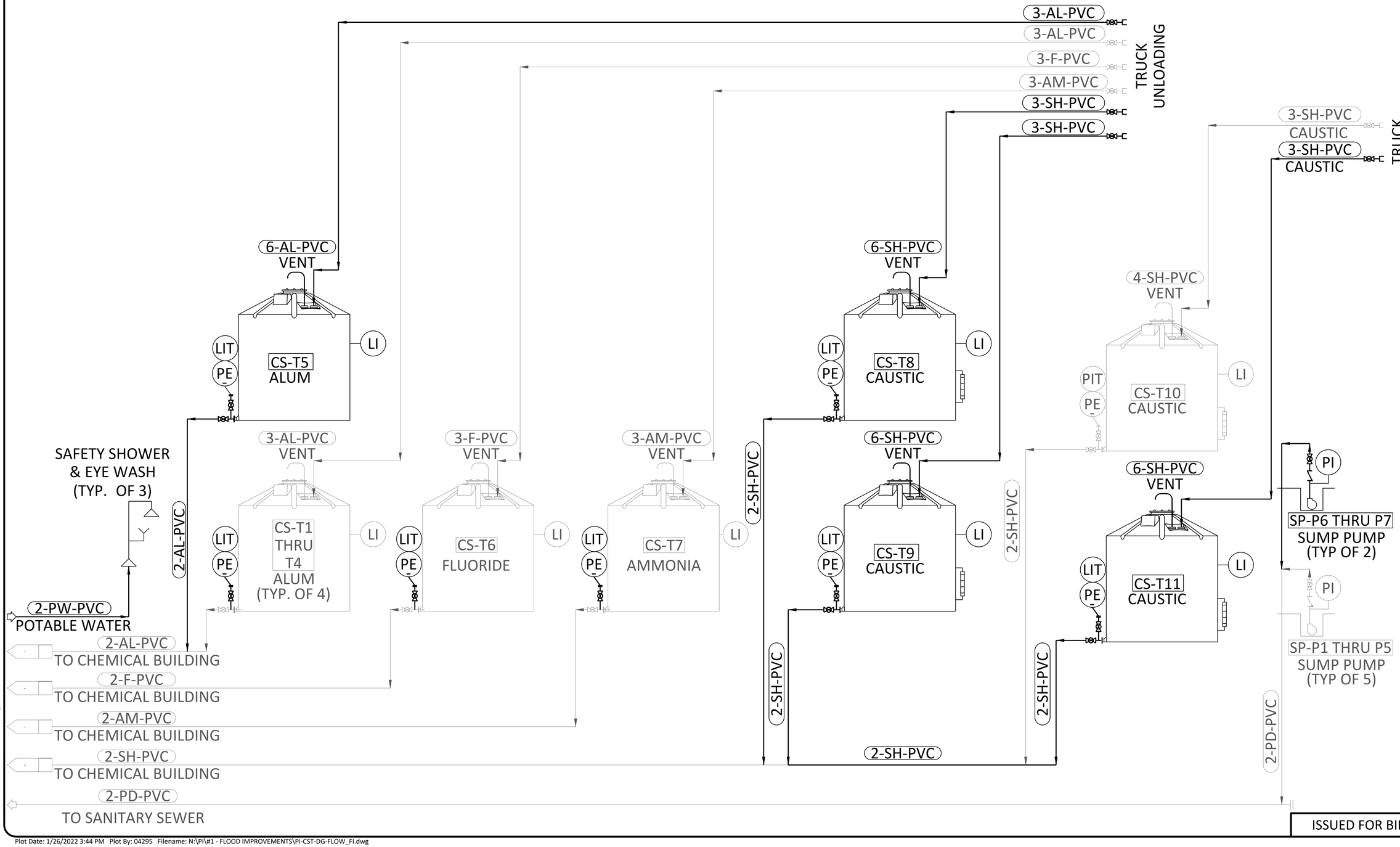
Last Saved: 2/9/2022 2:29 PM Saved By: 02789

Plot Date: 2/9/2022 2:30 PM Plot By: 02789 Filename: N:\PI\PI-ALL-DG-LOOP01_FI.dwg

GENERAL NOTE:

1. ALL PROPOSED CAUSTIC PIPING AND TANKS SHALL BE INSULATED AND HEAT TRACED.



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Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

02-01-2022

STATE OF TEXAS
118305
LICENSED
PROFESSIONAL ENGINEER

FREESE NICHOLS

11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
PROCESS & INSTRUMENTATION
BULK CHEMICAL STORAGE FACILITY
PROCESS DIAGRAM

NO.	ISSUE	BY	DATE

F&N JOB NO. BMT21704
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VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1

SHEET G-PI-4
SEQ. 9

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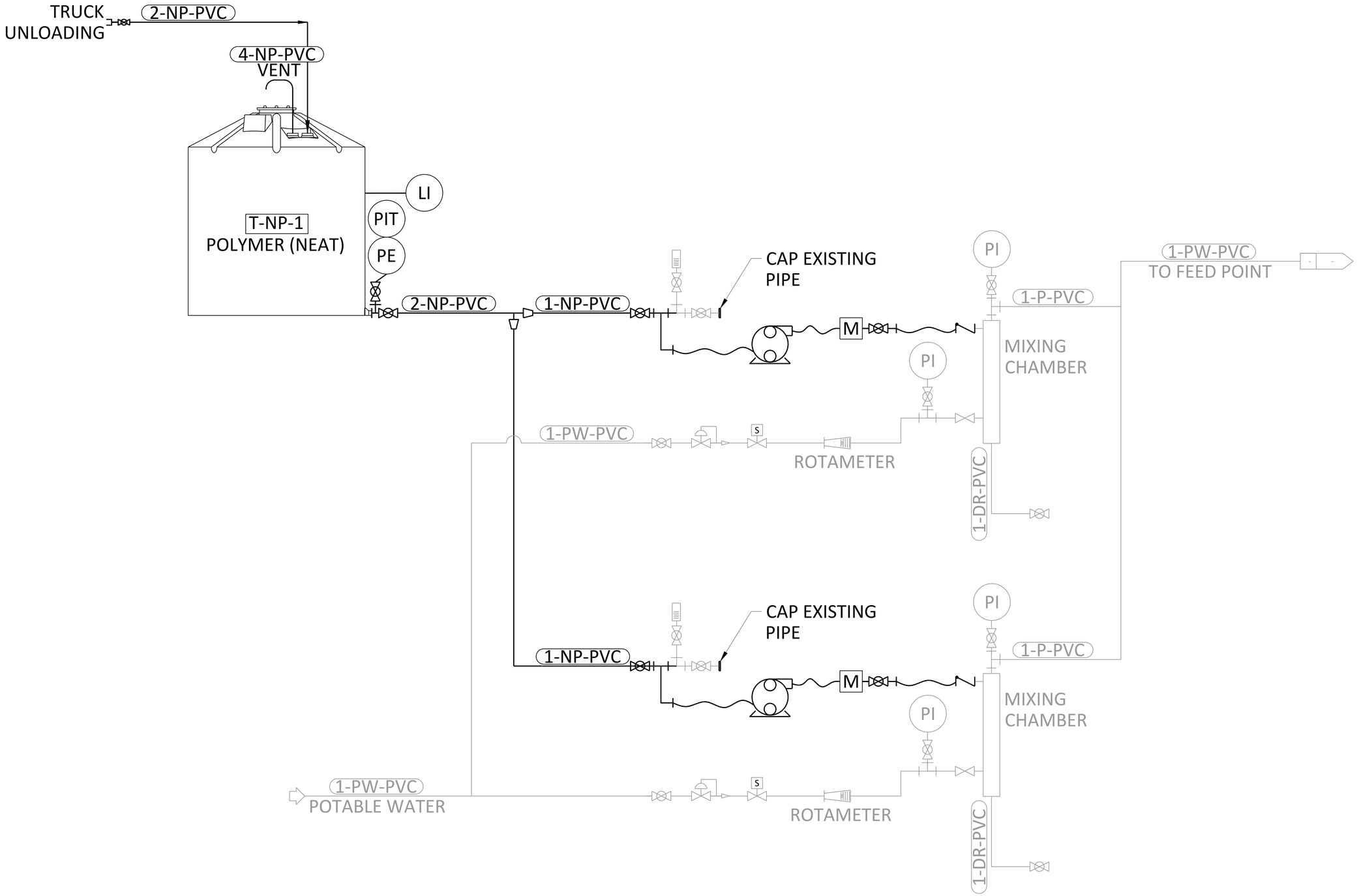

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Texas Registered Engineering Firm F-2144

02-01-2022

STATE OF TEXAS
JOHNATH CHILMUR
118309
LICENSED
PROFESSIONAL ENGINEER

FREESE NICHOLS

11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
PROCESS & INSTRUMENTATION

POLYMER SYSTEM PROCESS DIAGRAM

F&N JOB NO. BMT21704
DATE 01/28/2022
DESIGNED HW
DRAWN HW
REVISED CD
CHECKED JWM
FILE NAME PI-ALL-DG-PROC01.dwg

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0 1

SHEET G-PI-5
SEQ. 10

ACAD Rel: 24.0s (LMS Tech)
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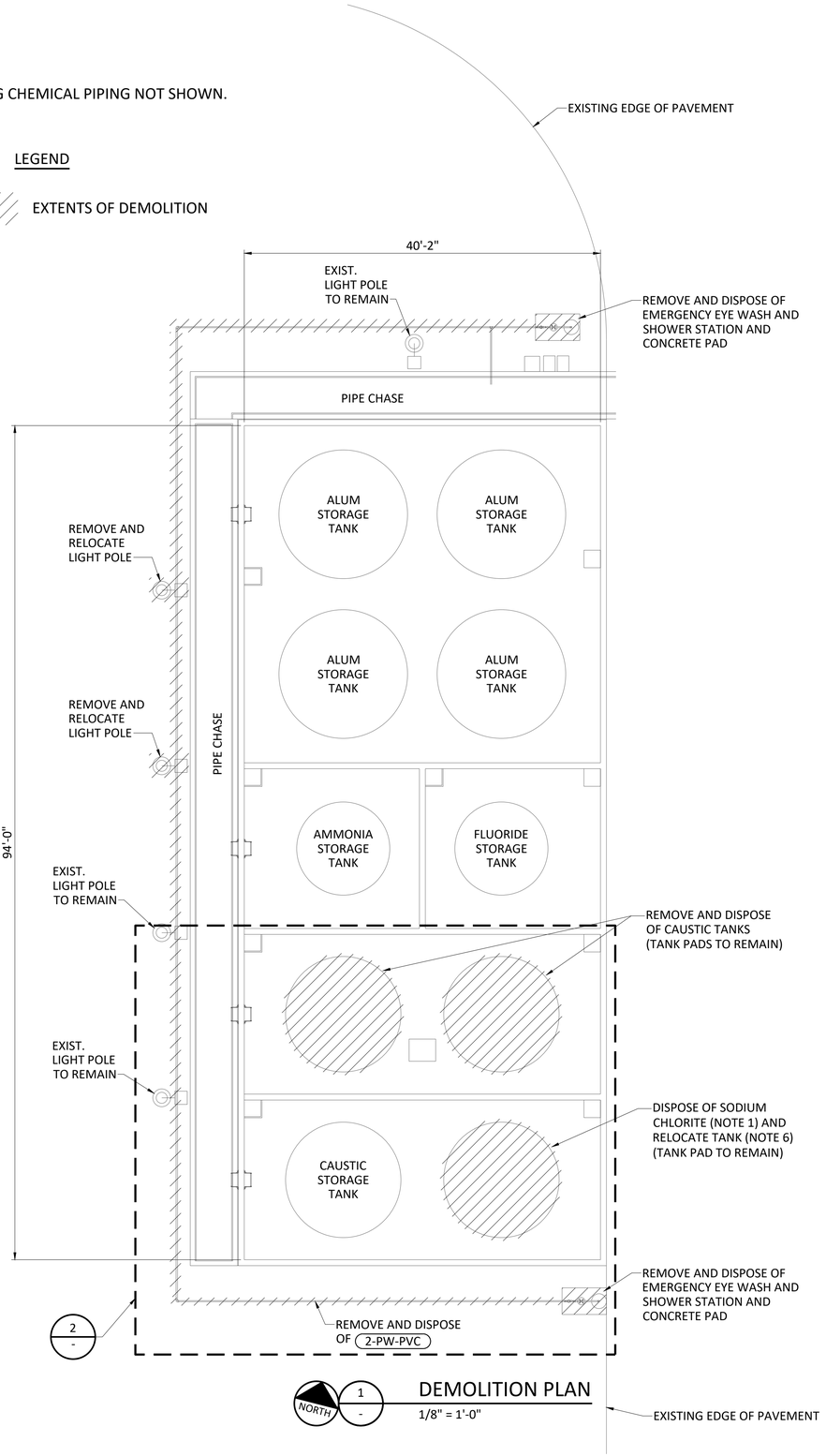
NOTE:

1. EXISTING CHEMICAL PIPING NOT SHOWN.

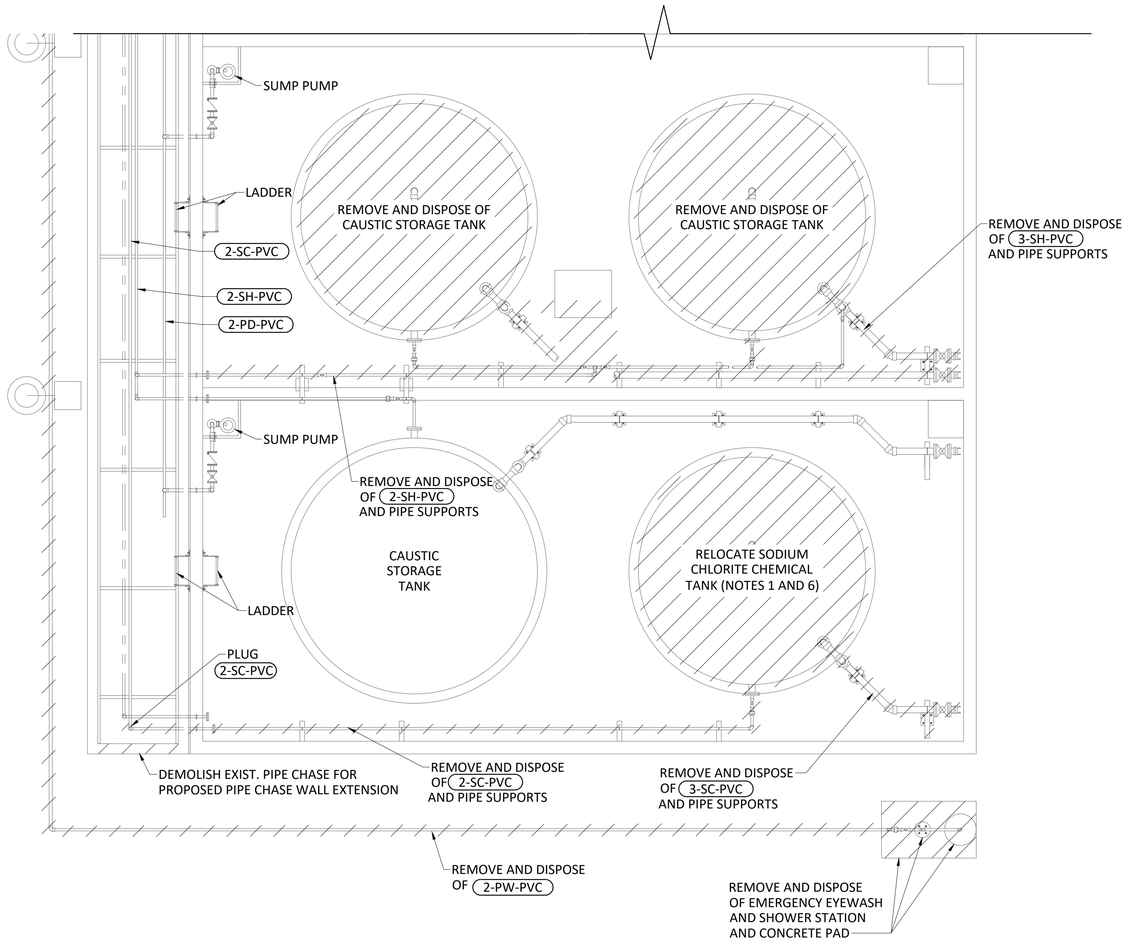
LEGEND

EXTENTS OF DEMOLITION



GENERAL NOTES:

1. CONTRACTOR TO DISPOSE OF SODIUM CHLORITE CHEMICAL PRIOR TO DEMOLITION OF PIPING AND RELOCATION OF TANK.
2. CONTRACTOR TO TRANSFER CHEMICAL FROM EXISTING CAUSTIC STORAGE TANKS TO NEW CAUSTIC STORAGE TANKS PRIOR TO DEMOLITION OF EXISTING CAUSTIC TANKS.
3. CONTRACTOR TO ENSURE THAT CAUSTIC TANKS ARE EMPTY PRIOR TO DEMOLITION OF PIPING.
4. CAUSTIC SODA AND SODIUM CHLORITE SOLUTION ARE VERY CORROSIVE CHEMICALS. WORKERS SHALL BE THOROUGHLY TRAINED REGARDING THE HAZARDS OF THESE CHEMICALS BEFORE STARTING ANY WORK.
5. IF CONTRACTOR DAMAGES ANY ITEM TO BE REUSED OR RETURNED TO OWNER, CONTRACTOR IS RESPONSIBLE FOR REPLACEMENT COSTS.
6. CONTRACTOR TO REMOVE SODIUM CHLORITE TANK FROM EXISTING LOCATION AND PLACE ON PROPOSED TANK PAD AS SHOWN ON DRAWING CS-M-2 AND CAP PIPE INLETS AND OUTLETS TO MAKE THE TANK WATER TIGHT.



0 1' 2' 4' 8'
1/4"=1'-0"

0 4' 8' 16'
1/8"=1'-0"

ISSUED FOR BID

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

02-01-2022

STATE OF TEXAS
SAMANTHA CHELMUSH
118309
LICENSED
PROFESSIONAL ENGINEER

FREESE NICHOLS

11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
MECHANICAL
BULK CHEMICAL STORAGE FACILITY DEMOLITION PLAN

NO.	ISSUE	BY	DATE

F&N JOB NO. BMT21704
DATE 01/28/2022
DESIGNED RT
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FILE NAME MP-CSF-PL-DEMO.dwg

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1
0

SHEET CS-M-1
SEQ. 11

ACAD Rel: 24.0s (LMS Tech)
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Last Saved: 1/26/2022 12:14 PM Saved By: 04295

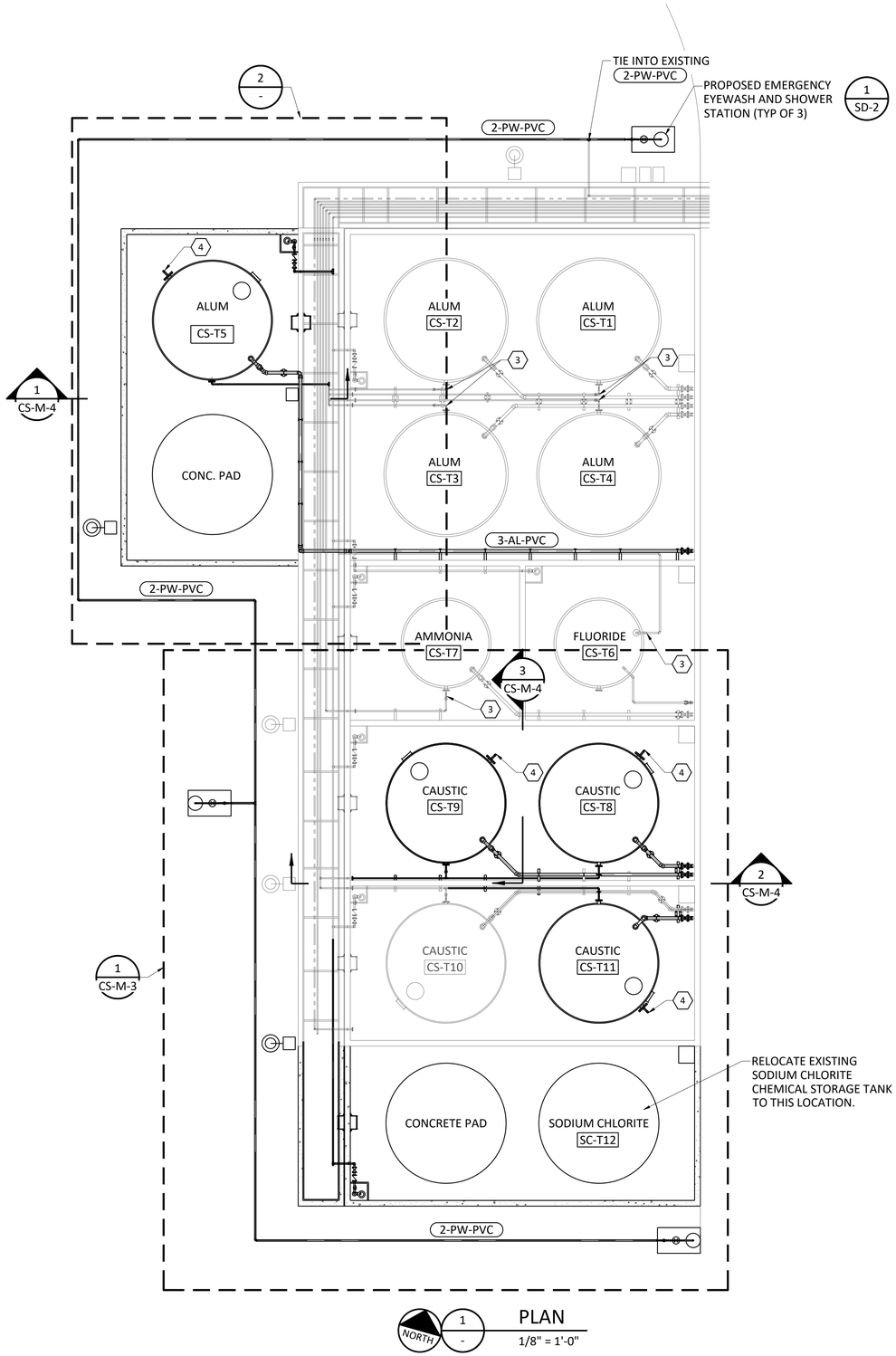
Plot Date: 1/26/2022 4:00 PM Plot By: 04295 Filename: N:\WW\MP-CSF-PL-DEMO.dwg

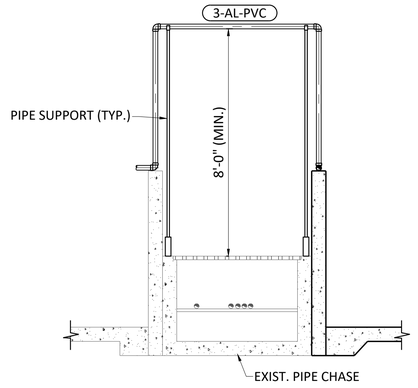
GENERAL NOTES:

1. CONTRACTOR TO ENSURE THAT CHEMICAL TANKS ARE EMPTY PRIOR TO ASSOCIATED PIPING MODIFICATIONS.
2. ALL CAUSTIC STORAGE TANKS AND NEW CAUSTIC PIPING TO BE HEAT TRACED AND INSULATED.
3. CONTRACTOR TO VERIFY LOCATION OF EXISTING LIGHT POLES. LOCATE THE 2-PW-PVC LINE SUCH THAT IT DOES NOT CONFLICT WITH THE LIGHT POLES.
4. CONTRACTOR TO APPLY PROTECTIVE COATING TO ALL NEW AND EXISTING CONCRETE IN THE CHEMICAL STORAGE TANK CONTAINMENT AREA PER SPECIFICATION SECTION 09 96 00.01

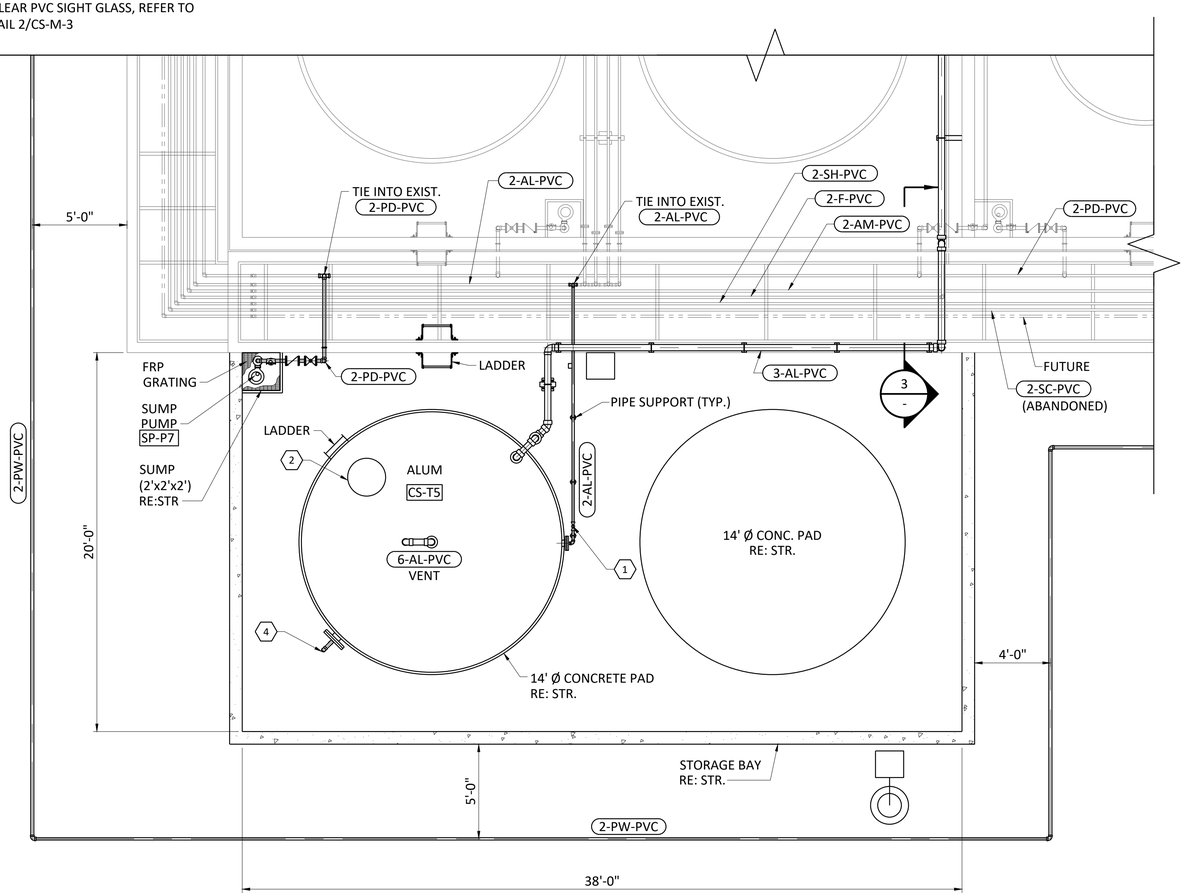
NOTE BY SYMBOL "⬡"

1. PROVIDE STAINLESS STEEL VALVE AT TANK OUTLET.
2. COORDINATE LOCATION OF MANWAY WITHIN 2 FEET OF ACCESS LADDER LOCATION.
3. REPLACE EXISTING PRESSURE TRANSMITTER ON OUTLET LINE IN KIND.
4. 1" CLEAR PVC SIGHT GLASS, REFER TO DETAIL 2/CS-M-3





3 - SECTION
3/8" = 1'-0"



NORTH 2 - PLAN DETAIL
1/4" = 1'-0"

0 1' 2' 4'
3/8"=1'-0

0 1' 2' 4' 8'
1/4"=1'-0"

0 4' 8' 16'
1/8"=1'-0"

ISSUED FOR BID

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

02-01-2022

STATE OF TEXAS · 118309 · LICENSED PROFESSIONAL ENGINEER

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
MECHANICAL
BULK CHEMICAL STORAGE FACILITY
PROPOSED PLANS & SECTION

R&V JOB NO.	BMT21704
DATE	01/28/2022
DESIGNED	RT
DRAWN	WB
REVISED	-
CHECKED	MM
FILE NAME	MP-CSF-PL-PIPE.dwg

NO.	ISSUE	BY	DATE

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0 1

SHEET CS-M-2
SEQ. 12

ACAD Rel: 24.0s (LMS Tech)
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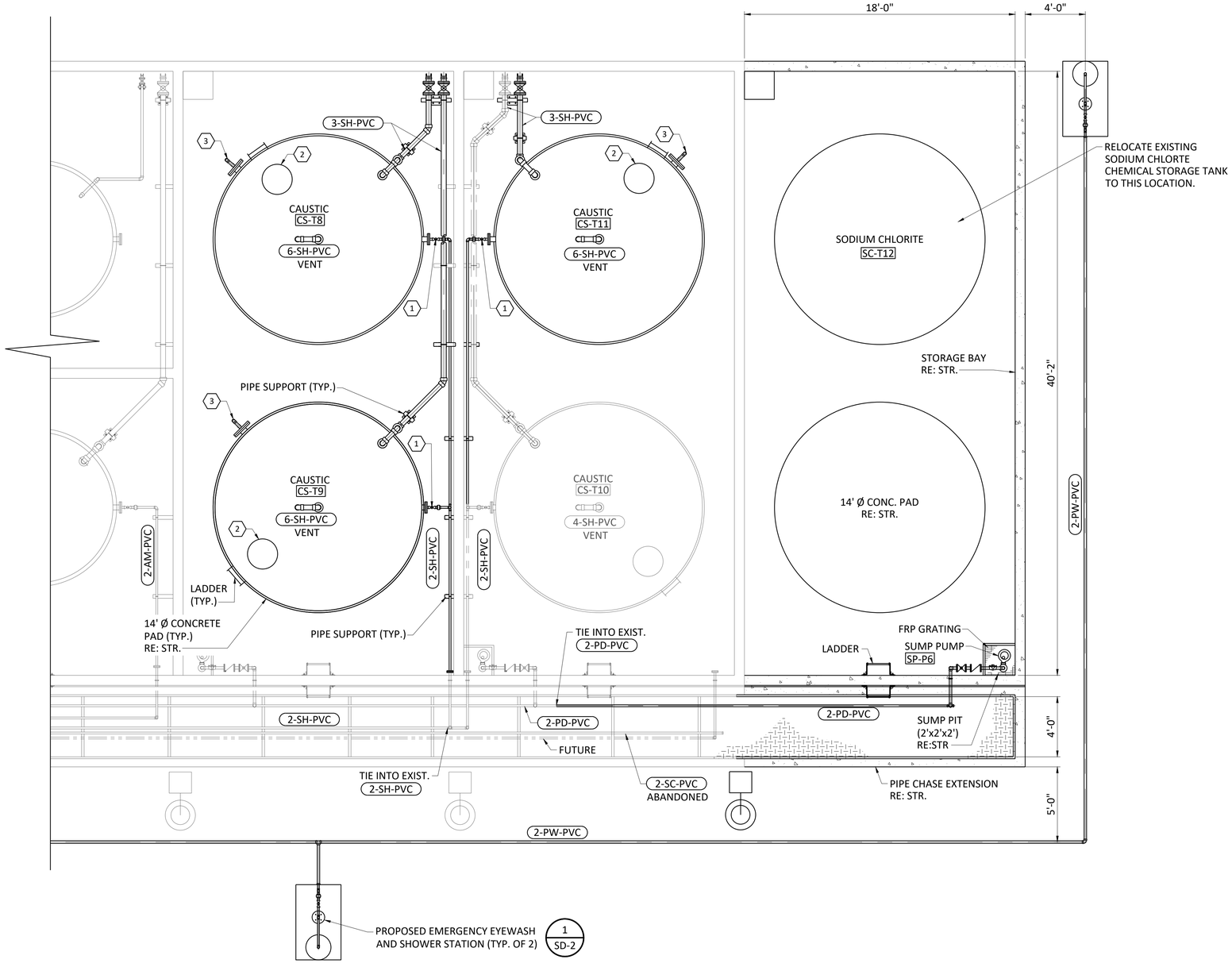


1 / - PLAN

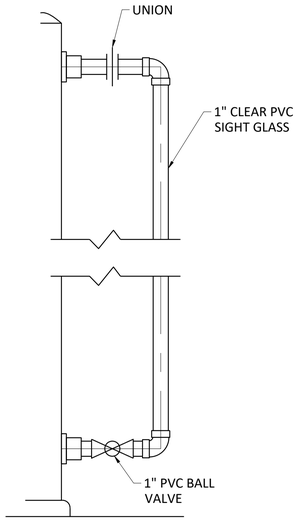
1/4" = 1'-0"

GENERAL NOTES:

1. CONTRACTOR TO ENSURE THAT CHEMICAL TANKS ARE EMPTY PRIOR TO ASSOCIATED PIPING MODIFICATIONS.
2. ALL CAUSTIC STORAGE TANKS AND NEW CAUSTIC PIPING TO BE HEAT TRACED AND INSULATED.
3. CONTRACTOR TO VERIFY LOCATION OF EXISTING LIGHT POLES. LOCATE THE (2-PW-PVC) LINE SUCH THAT IT DOES NOT CONFLICT WITH THE LIGHT POLES.
4. CONTRACTOR TO APPLY PROTECTIVE COATING TO ALL NEW AND EXISTING CONCRETE IN THE CHEMICAL STORAGE TANK CONTAINMENT AREA PER SPECIFICATION SECTION 09 96 00.01.

NOTE BY SYMBOL "⬡"

1. PROVIDE STAINLESS STEEL VALVE AT TANK OUTLET.
2. COORDINATE LOCATION OF MANWAY WITHIN 2 FEET OF ACCESS LADDER LOCATION.
3. 1" CLEAR PVC SIGHT GLASS, REFER TO DETAIL 2/CS-M-3



2 / - SIGHT GLASS DETAIL

NOT TO SCALE

0 1' 2' 4' 8'

1/4"=1'-0"

ISSUED FOR BID

Freese and Nichols, Inc
Texas Registered Engineering Firm F-2144

02-01-2022

STATE OF TEXAS — 118305 — LICENSED PROFESSIONAL ENGINEER — FINAL

FREESE NICHOLS

11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
MECHANICAL

BULK CHEMICAL STORAGE FACILITY PROPOSED PLAN

F&N JOB NO. BMT21704
DATE 01/28/2022
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SHEET CS-M-3

SEQ. 13

ACAD Rel: 24.0s (LMS Tech)
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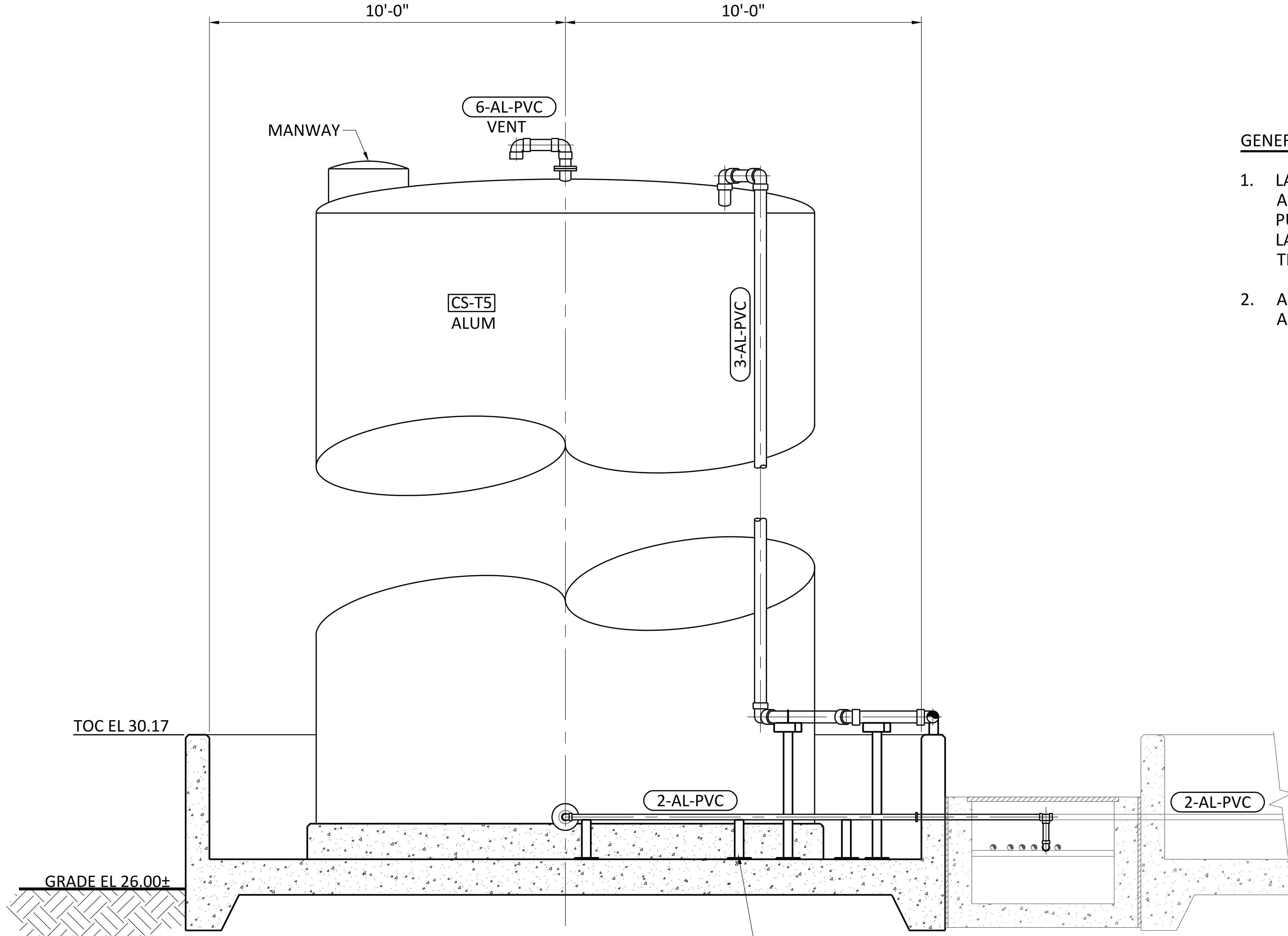
Plot Date: 1/26/2022 4:02 PM Plot By: 04295 Filename: N:\WW\MP-CSF-PL-PIPE.dwg

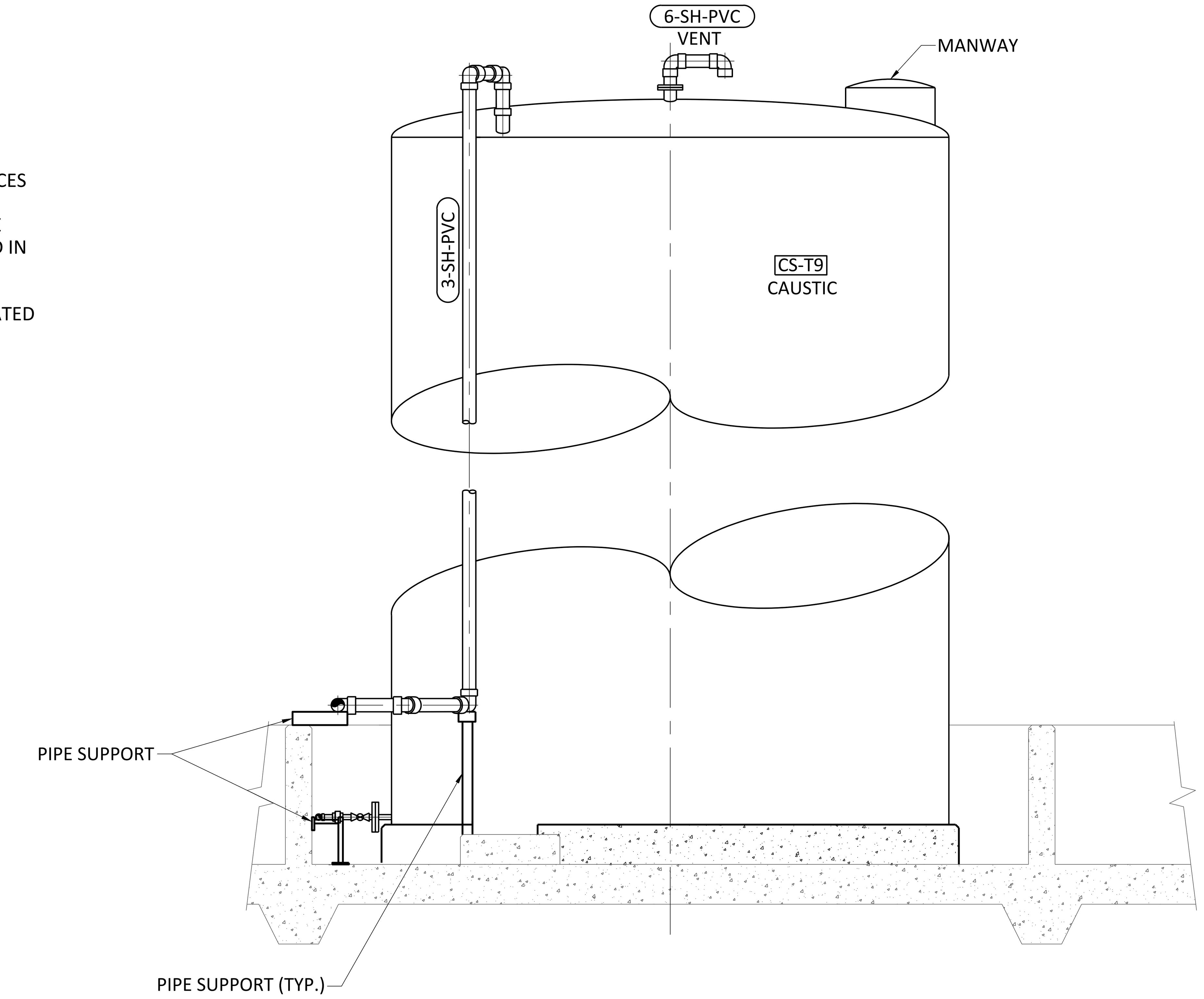


1 / CS-M-2 SECTION
3/8" = 1'-0"

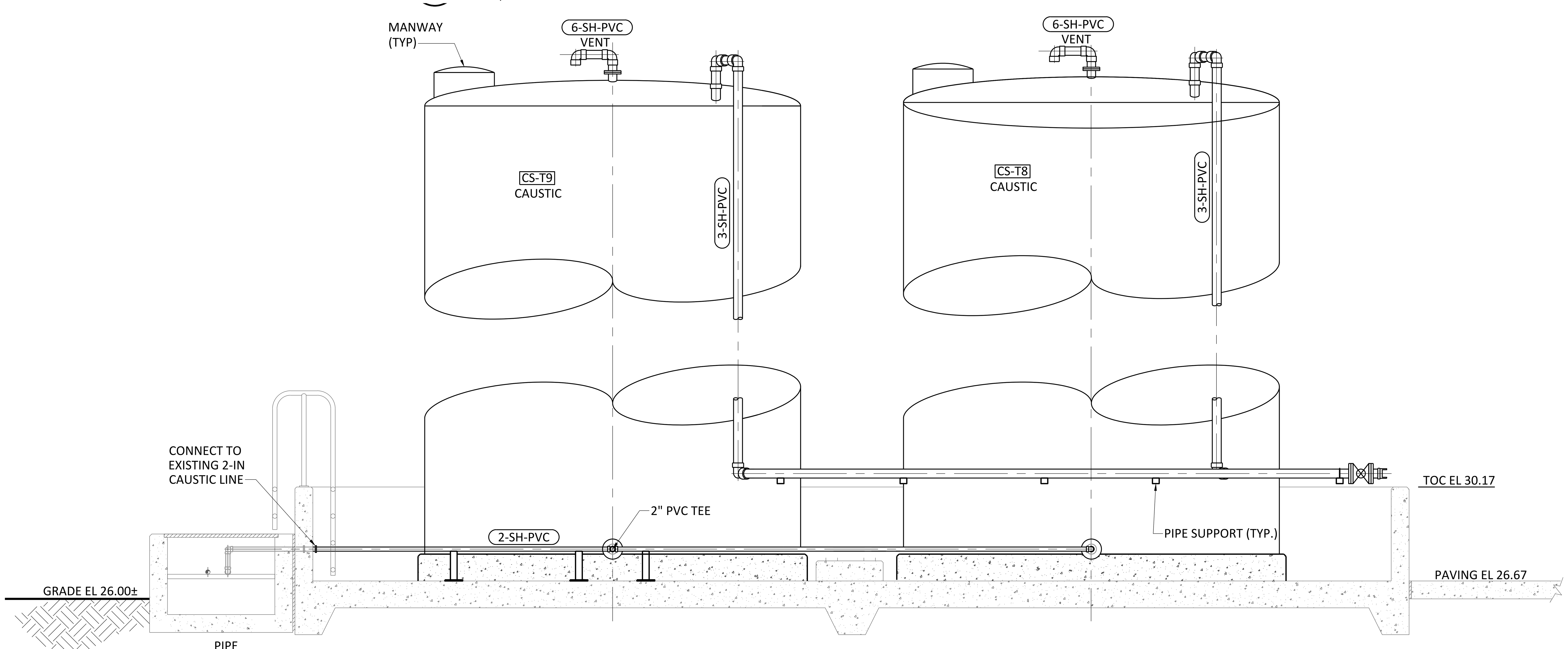
GENERAL NOTE:

1. LADDERS AND MISCELLANEOUS APPURTENANCES ARE NOT SHOWN ON TANKS FOR CLARITY PURPOSES. THE CONTRACTOR SHALL PROVIDE LADDERS AND ALL COMPONENTS AS SPECIFIED IN THE CONTRACT DOCUMENTS.

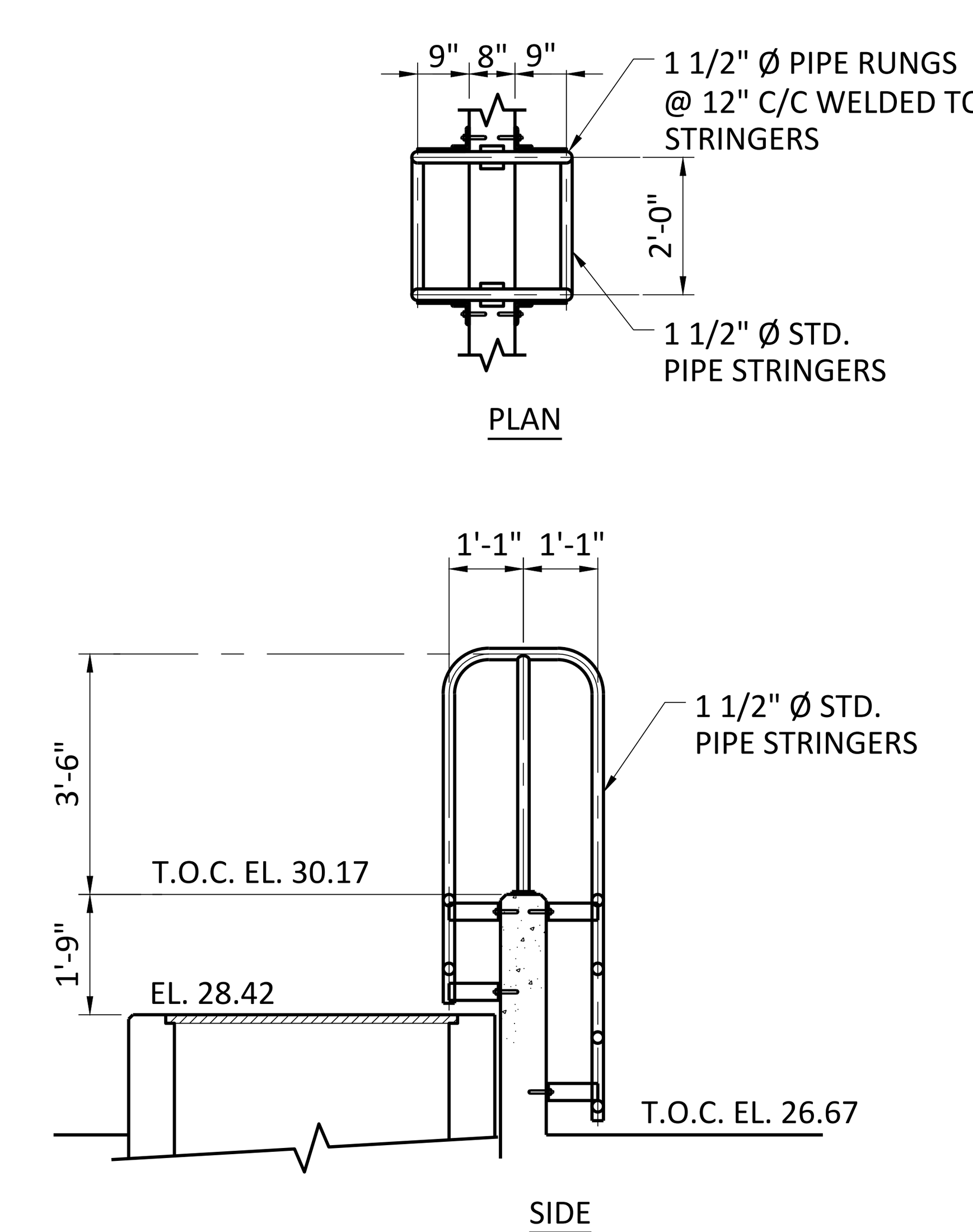
2. ALL CAUSTIC TANKS AND PIPING TO BE INSULATED AND HEAT TRACED.



3 / CS-M-2 SECTION
3/8" = 1'-0"



2 / CS-M-2 SECTION
3/8" = 1'-0"



4 / - LADDER DETAIL
3/8" = 1'-0"

0 1' 2' 4'
3/8"=1'-0

ISSUED FOR BID

02-01-2022

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

FREESE AND NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS

MECHANICAL
BULK CHEMICAL STORAGE FACILITY
PROPOSED SECTIONS & DETAILS

NO.	ISSUE	BY	DATE

F&N JOB NO.	BMT21704
DATE	01/28/2022
DESIGNED	RT
DRAWN	JG
REVISED	.
CHECKED	MM
FILE NAME	MP-CSF-SC-PIPE.dwg

VERIFY SCALE 0 1
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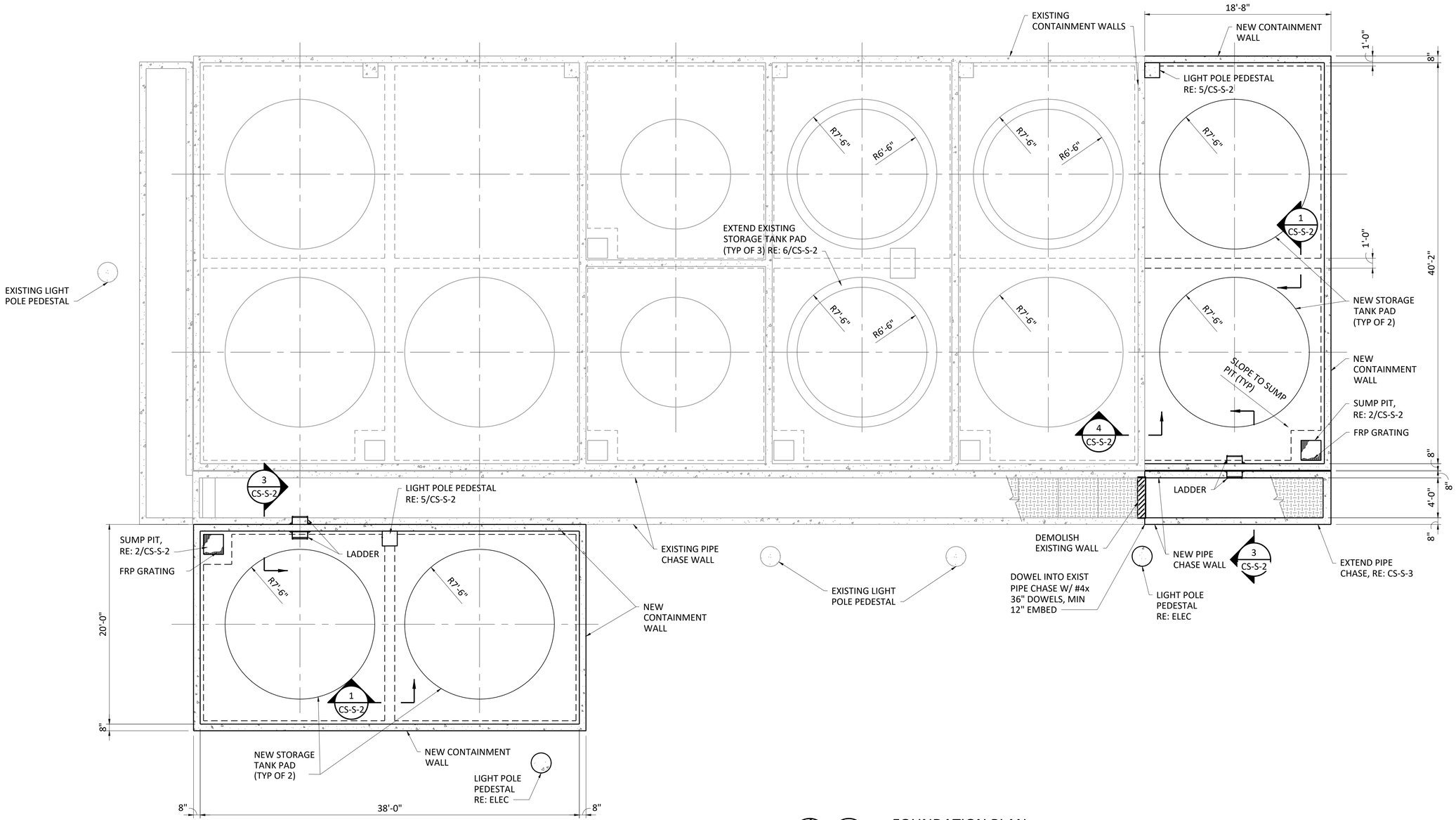
SHEET
CS-M-4

SEQ.
14



NORTH

1 - FOUNDATION PLAN

3/16"=1'-0"

0 4' 8'

3/16"=1'-0"

ISSUED FOR BID

SHEET CS-S-1

SEQ. 15

Freese and Nichols, Inc
Texas Registered Engineering Firm F-2144

STATE OF TEXAS
MICHAEL RAY ROBERTSON
97017
REGISTERED
PROFESSIONAL ENGINEER
01/28/2022

FREESE NICHOLS

11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
STRUCTURAL

FOUNDATION PLAN

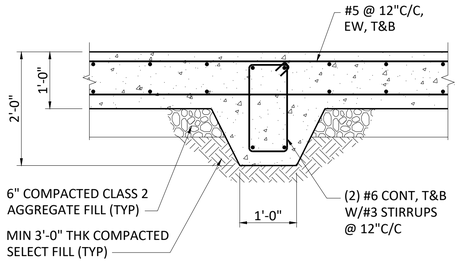
NO.	ISSUE	BY	DATE

F&N JOB NO. BMT21704
DATE 01/28/2022
DESIGNED MRR
DRAWN JLM
REVISED -
CHECKED PAB
FILE NAME ST-CS-PL-FNDN1.dwg

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1

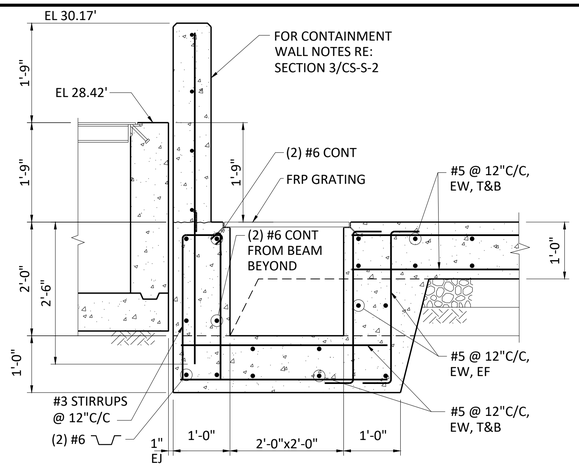
ACAD Rel: 23.0s (LMS Tech)
Filename: N:\ST\ST-CS-PL-FNDN1.dwg
Last Saved: 12/3/2021 9:04 AM Saved By: jaw

Plot Date: 1/27/2022 11:58 AM Plot By: 02856 Filename: N:\ST\ST-CS-PL-FNDN1.dwg



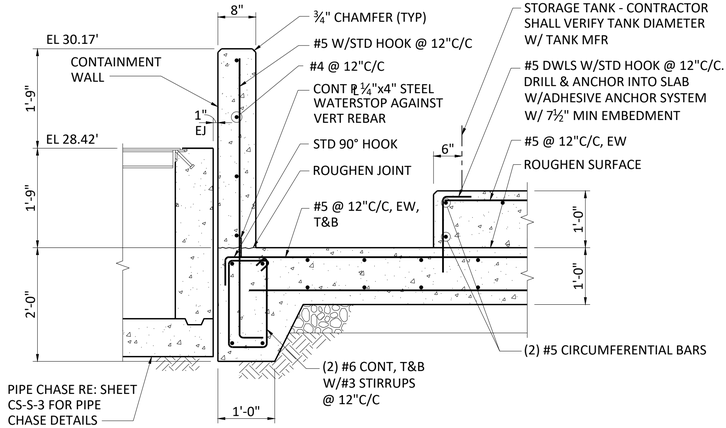
1 CS-S-2 **SECTION**

3/4"=1'-0"



2 CS-S-2 **SUMP PIT SECTION**

3/4"=1'-0"



3 CS-S-2 **SECTION**

3/4"=1'-0"

4 CS-S-2 **SECTION**

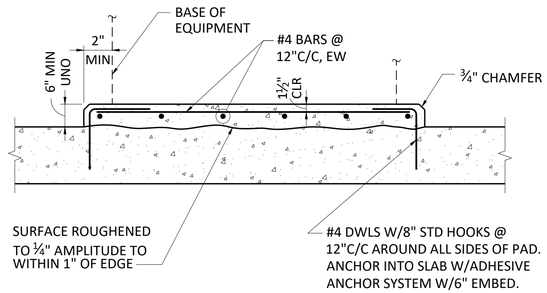
3/4"=1'-0"

5 CS-S-2 **SECTION AT PEDESTAL**

3/4"=1'-0"

6 CS-S-2 **SECTION AT EXISTING STORAGE TANK PAD**

3/4"=1'-0"

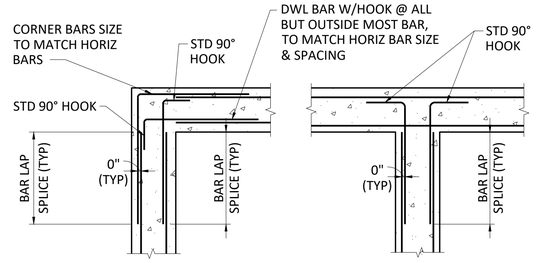


NOTES:

1. COORDINATE EQUIPMENT PAD HEIGHT AND PLAN DIMENSIONS WITH EQUIPMENT MANUFACTURER.

7 - **EQUIPMENT PAD**

NOT TO SCALE



DETAIL NOTES:

1. REINFORCING SHOWN APPLIES TO ALL TOP, BOTTOM AND SIDE BARS. ALL REQUIRED BARS AR NOT SHOWN IN DETAIL.
2. AT CONTRACTOR'S OPTION, UNLESS NOTED OTHERWISE, ELIMINATE DOWELS AND TERMINATE HORIZONTAL BARS WITH STANDARD HOOKS.

8 - **CORNER & INTERSECTION REINFORCEMENT**

NOT TO SCALE

Freese and Nichols, Inc
Texas Registered Engineering Firm F-2144

STATE OF TEXAS
MICHAEL RAY ROBERTSON
97012
LICENSED PROFESSIONAL ENGINEER
01/28/2022

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
STRUCTURAL

BULK CHEMICAL STORAGE FACILITY SECTIONS

NO.	ISSUE	BY	DATE
1	ISSUED FOR BID		

F&N JOB NO. BMT21704
DATE 01/28/2022
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FILE NAME ST-CS-PL-FNDN.dwg

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0 1

0 6" 1' 2'
3/4"=1'-0

SHEET CS-S-2

SEQ. 16

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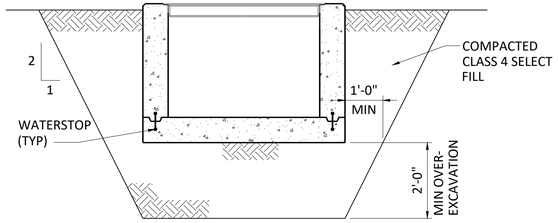
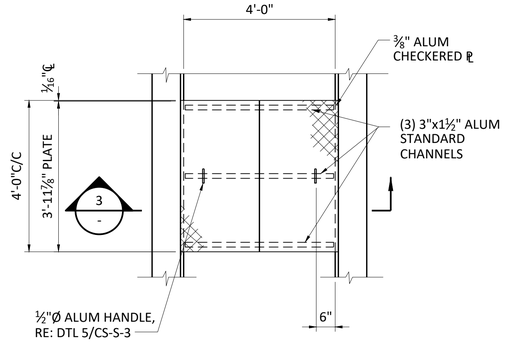
Filename: N:\ST\ST-CS-PL-FNDN.dwg
Last Saved: 12/3/2021 9:04 AM Saved By: jaw

Plot Date: 1/27/2022 11:58 AM Plot By: 02856 Filename: N:\ST\ST-CS-PL-FNDN.dwg



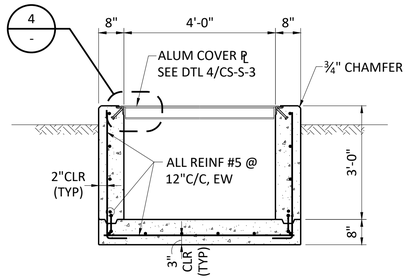
1 - TYPICAL EXCAVATION AND BACKFILL FOR PIPE CHASE

1/2"=1'-0"



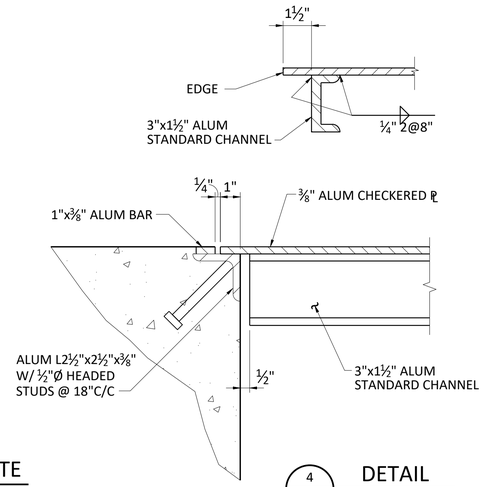
2 - TYPICAL PIPE CHASE WITH REMOVABLE ALUMINUM CHECKERED COVER PLATE - PLAN

1/2"=1'-0"



3 - TYPICAL PIPE CHASE WITH REMOVABLE ALUMINUM COVER PLATE

1/2"=1'-0"



4 - DETAIL

3"=1'-0"

5 - LIFTING HANDLE DETAIL

3"=1'-0"

NOTES:

1. AS AN OPTION, EXISTING REINFORCING STEEL CAN BE CUT AND REMOVED. PROVIDE #4 x 2'-0" ADHESIVE DOWELS @ 12"C/C W/10" EMBEDMENT IN THE EXISTING CONCRETE PAVEMENT.

6 - SLAB TRENCHING DETAIL

NOT TO SCALE

0 1" 2" 4" 8"
3"=1'-0"

0 1' 2' 4'
1/2"=1'-0"

ISSUED FOR BID

Freese and Nichols, Inc
Texas Registered Engineering Firm F-2144

STATE OF TEXAS
MICHAEL RAY ROBERTSON
59701
LICENSED PROFESSIONAL ENGINEER
01/28/2022

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
STRUCTURAL
BULK CHEMICAL STORAGE FACILITY SECTIONS AND DETAILS

NO.	ISSUE	BY	DATE

F&N JOB NO. BMT21704
DATE 01/28/2022
DESIGNED MRR
DRAWN JLW
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FILE NAME ST-CS-SC-DTLS.dwg

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0 1

SHEET CS-S-3
SEQ. 17

AC-AD Ref: Z3 Us (LMS Tech)
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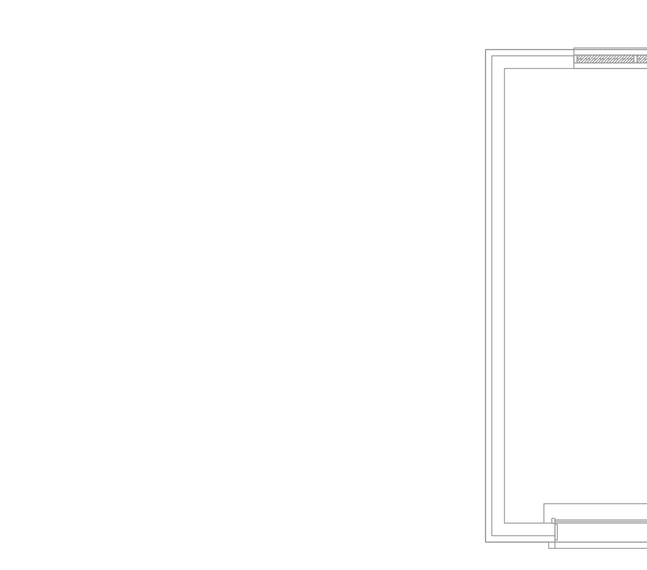
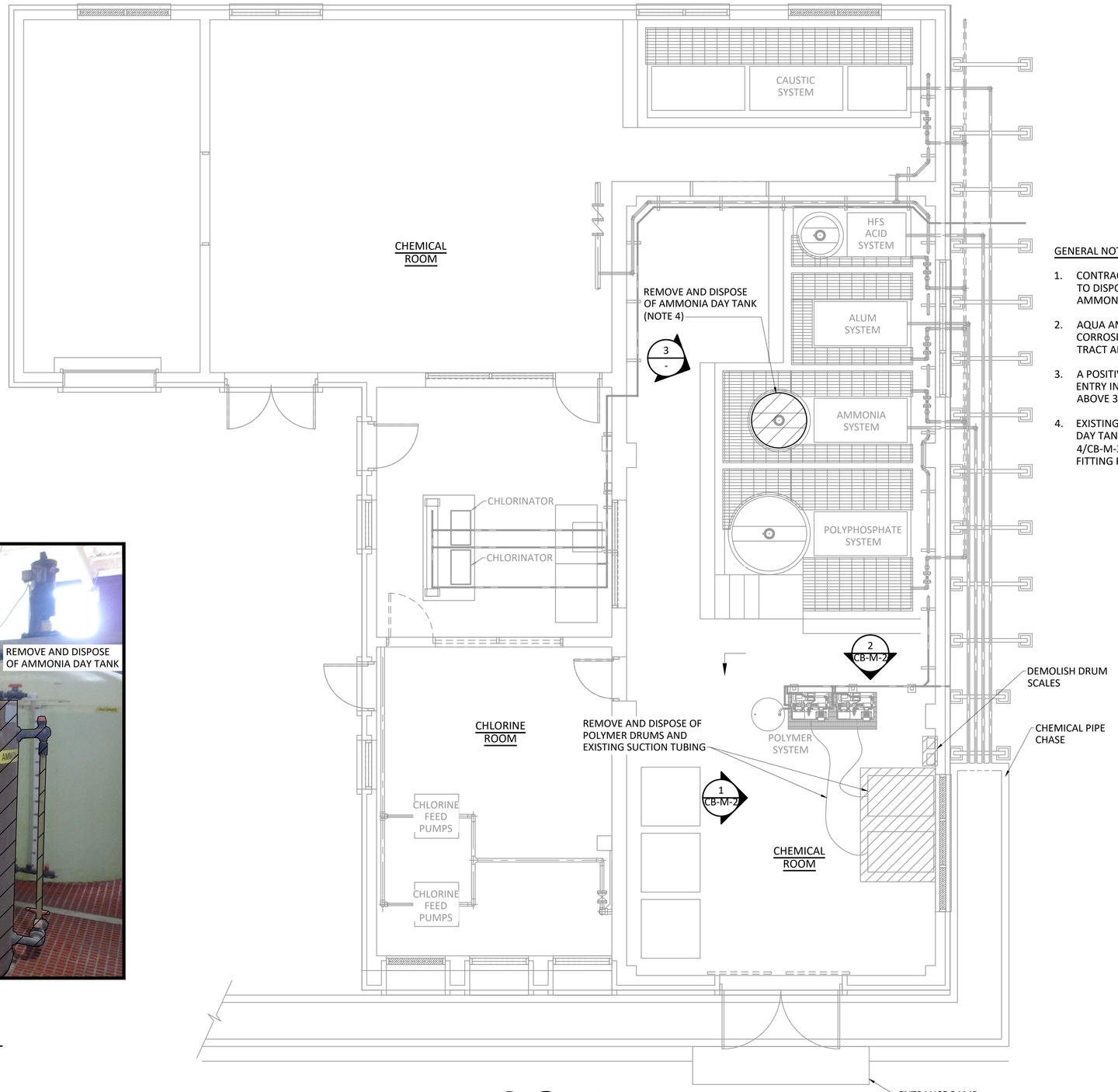


3 / - DEMOLITION PHOTOGRAPH
NOT TO SCALE



NORTH 1 / - PLAN
1/4" = 1'-0"

GENERAL NOTES:

1. CONTRACTOR TO COORDINATE WITH CITY PRIOR TO DISPOSAL OF CHEMICAL FROM EXISTING AMMONIA DAY TANK.
2. AQUA AMMONIA IS AN IRRITANT AND CORROSIVE TO THE SKIN, EYES, RESPIRATORY TRACT AND MUCUS MEMBRANE.
3. A POSITIVE PRESSURE SCBA IS REQUIRED FOR ENTRY INTO AMMONIA ATMOSPHERES AT OR ABOVE 300 PPM.
4. EXISTING PIPING TO AND FROM THE AMMONIA DAY TANK TO REMAIN IN PLACE. REFER TO 4/CB-M-3 FOR EXTENT OF TANK AND PIPE FITTING REPLACEMENT.

0 1' 2' 4' 8'
1/4"=1'-0"

ISSUED FOR BID

Freese and Nichols, Inc
Texas Registered Engineering Firm F-2144

02-01-2022

STATE OF TEXAS
SUMANTH CHILUKURI
118309
LICENSED
PROFESSIONAL ENGINEER
SIGNATURE

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
MECHANICAL
CHEMICAL FEED BUILDING DEMOLITION PLAN

NO.	ISSUE	BY	DATE

VERIFY SCALE Bar is one inch on original drawing, if not one inch on this sheet, adjust scale.
0 1"

F&N JOB NO. BMT21704
DATE 01/28/2022
DESIGNED RT
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REVISED ----
CHECKED MM
FILE NAME WW-CFB-PL-BLDG.dwg

SHEET CB-M-1
SEQ. 18

ACAD Rel: 24.0s (LMS Tech)
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Last Saved: 12/1/2021 1:16 PM Saved By: 04295

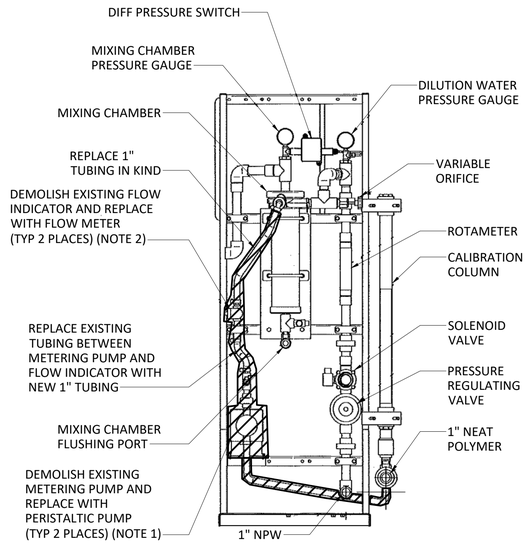
Plot Date: 1/26/2022 4:06 PM Plot By: 04295 Filename: N:\WW\WW-CFB-PL-BLDG.dwg

NOTES:

1. PERISTALTIC METERING PUMP TO BE WATSON MARLOW 20 PU METERING PUMP WITH CAPACITY OF 5.3 GPH AT 100 PSI OR APPROVED EQUAL.
2. FLOW METER TO BE 1" ENDRESS+HAUSER PROMAG W 400 OR APPROVED EQUAL.

1 CB-M-1 DEMOLITION PHOTOGRAPH - POLYMER DRUMS

NOT TO SCALE



2 CB-M-1 EXISTING POLYMER SKID ELEVATION

NOT TO SCALE

0 1' 2' 4' 8'

1/4"=1'-0"

ISSUED FOR BID

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

STATE OF TEXAS
SUMANTH CHILUKURI
118309
LICENSED
PROFESSIONAL ENGINEER
02-01-2022

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS

MECHANICAL

POLYMER SYSTEM
DEMOLITION SECTION

NO.	ISSUE	BY	DATE

F&N JOB NO. BMT21704
DATE 01/28/2022
DESIGNED RT
DRAWN CD
REVISED -
CHECKED ####

FILE NAME WW-CFB-PS-EQPT01.dwg

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1"

SHEET CB-M-2

SEQ. 19

ACAD Rel: 24.0s (LMS Tech)
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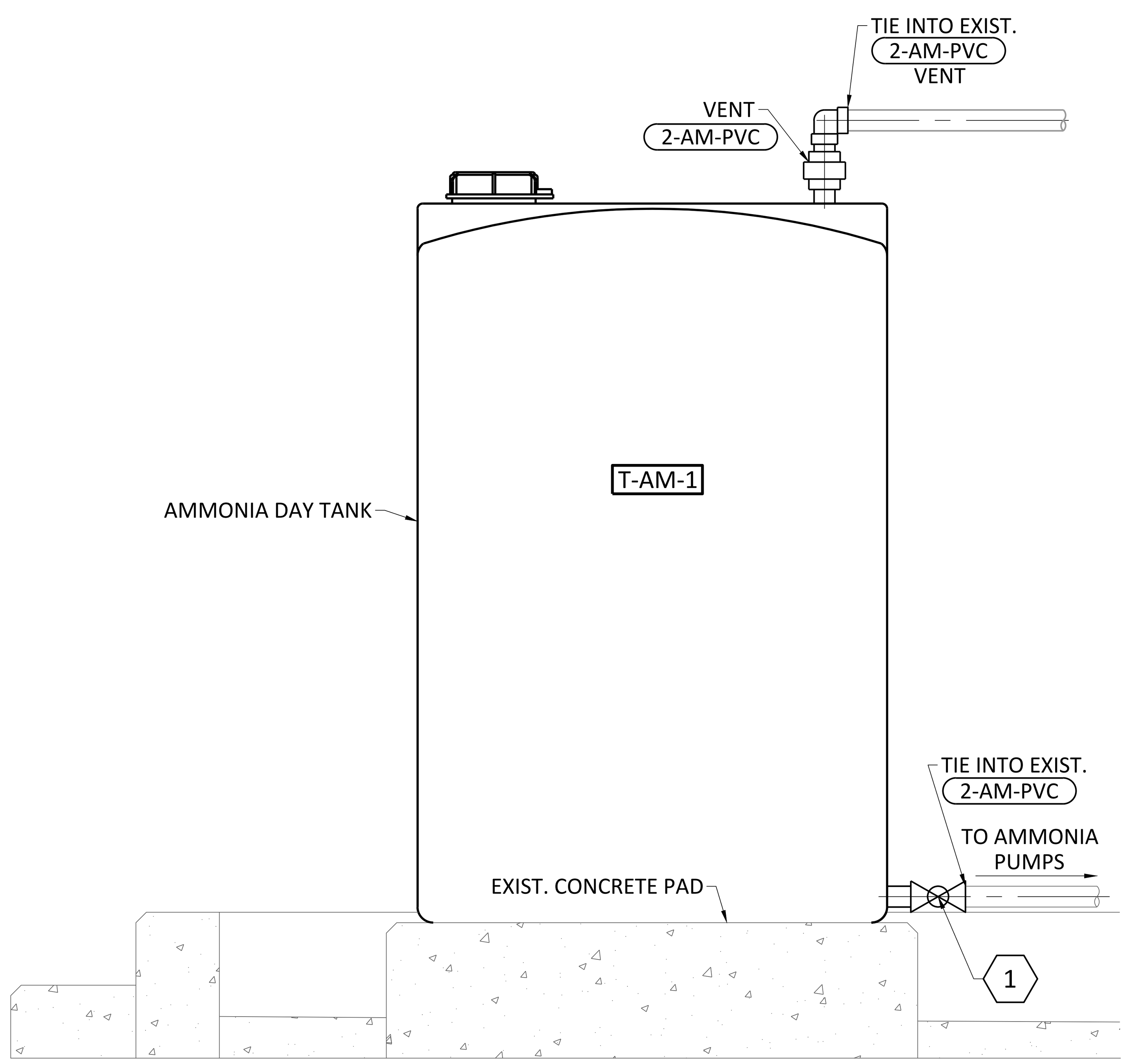
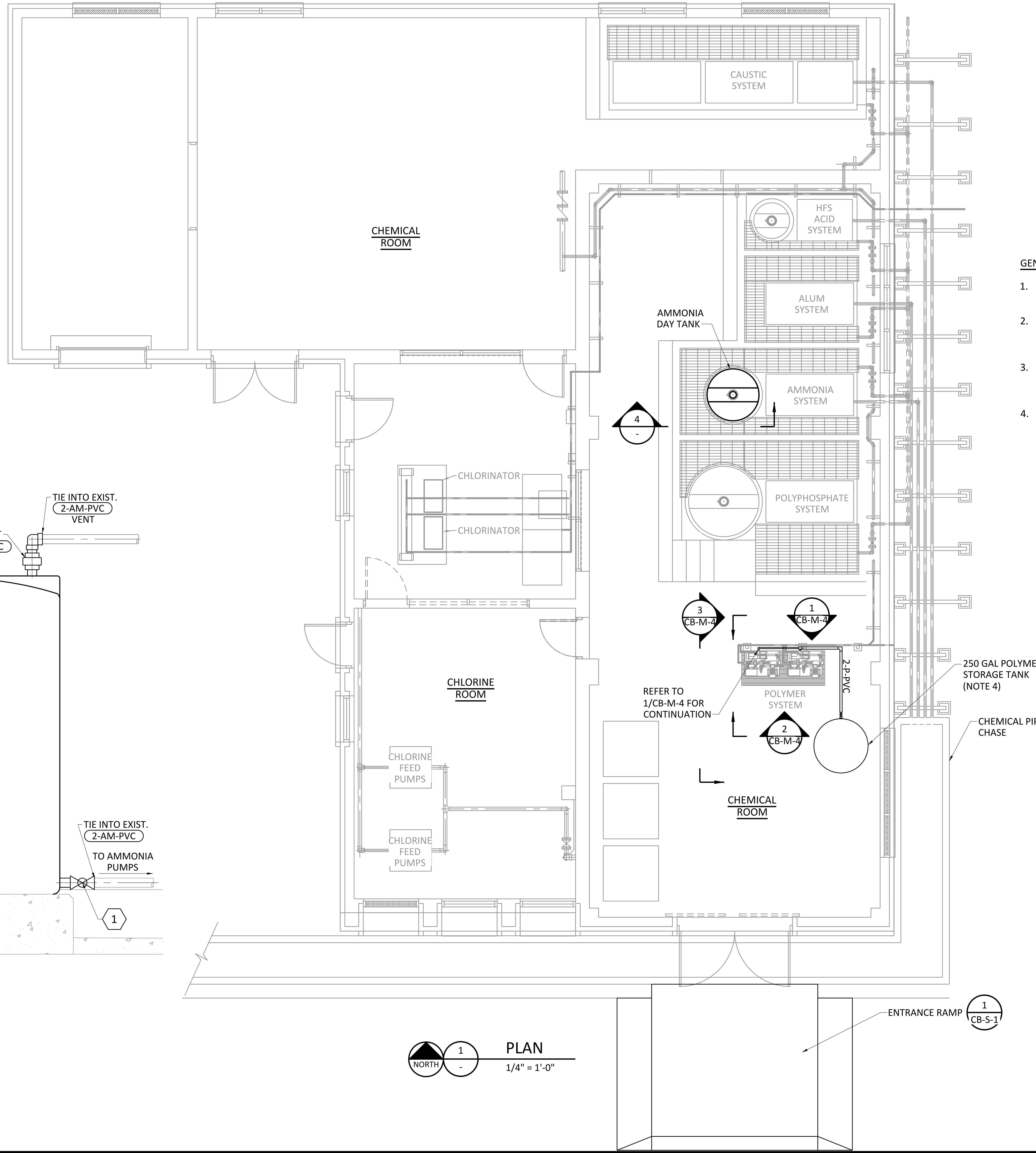
Plot Date: 1/26/2022 4:07 PM Plot By: 04295 Filename: N:\WW\WW-CFB-PS-EQPT01.dwg



4 / - SECTION
1" = 1'-0"



NORTH 1 / - PLAN
1/4" = 1'-0"

GENERAL NOTE:

1. CONTRACTOR TO ENSURE NEW AMMONIA DAY TANK IS FILLED PRIOR TO START UP.
2. AQUA AMMONIA IS AN IRRITANT AND CORROSIVE PRODUCT TO THE SKIN, EYES, AND REPARATORY TRACT, AND MUCUS MEMBRANE.
3. A PORTATIVE PRESSURE SCUBA IS REQUIRED FOR ENTRY INTO AMMONIA ATMOSPHERES AT OR ABOVE 300 PPM.
4. HDPE POLYMER STORAGE TANK TO BE DOUBLE WALLED TANK WITH 250 GAL CAPACITY.

NOTE BY SYMBOL "⬡"

1. PROVIDE STAINLESS STEEL VALVE AT TANK OUTLET.

0 6" 1' 2'
1"=1'-0"

0 1' 2' 4' 8'
1/4"=1'-0"

ISSUED FOR BID

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

STATE OF TEXAS
SOMNATH CHILUKURI
118309
LICENSED PROFESSIONAL ENGINEER
Somnath Chilukuri
02-01-2022

FREESE AND NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS

MECHANICAL
CHEMICAL FEED BUILDING
PROPOSED PLAN

F&N JOB NO.	BMT21704
DATE	01/28/2022
DESIGNED	RT
DRAWN	JG
REVISED	.
CHECKED	MM
FILE NAME	WW-CFB-PL-BLDG-PROP.dwg

NO.	ISSUE	BY	DATE

VERIFY SCALE 0 1
Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET CB-M-3
SEQ. 20

ACAD Rel: 24.0s (LMS Tech)
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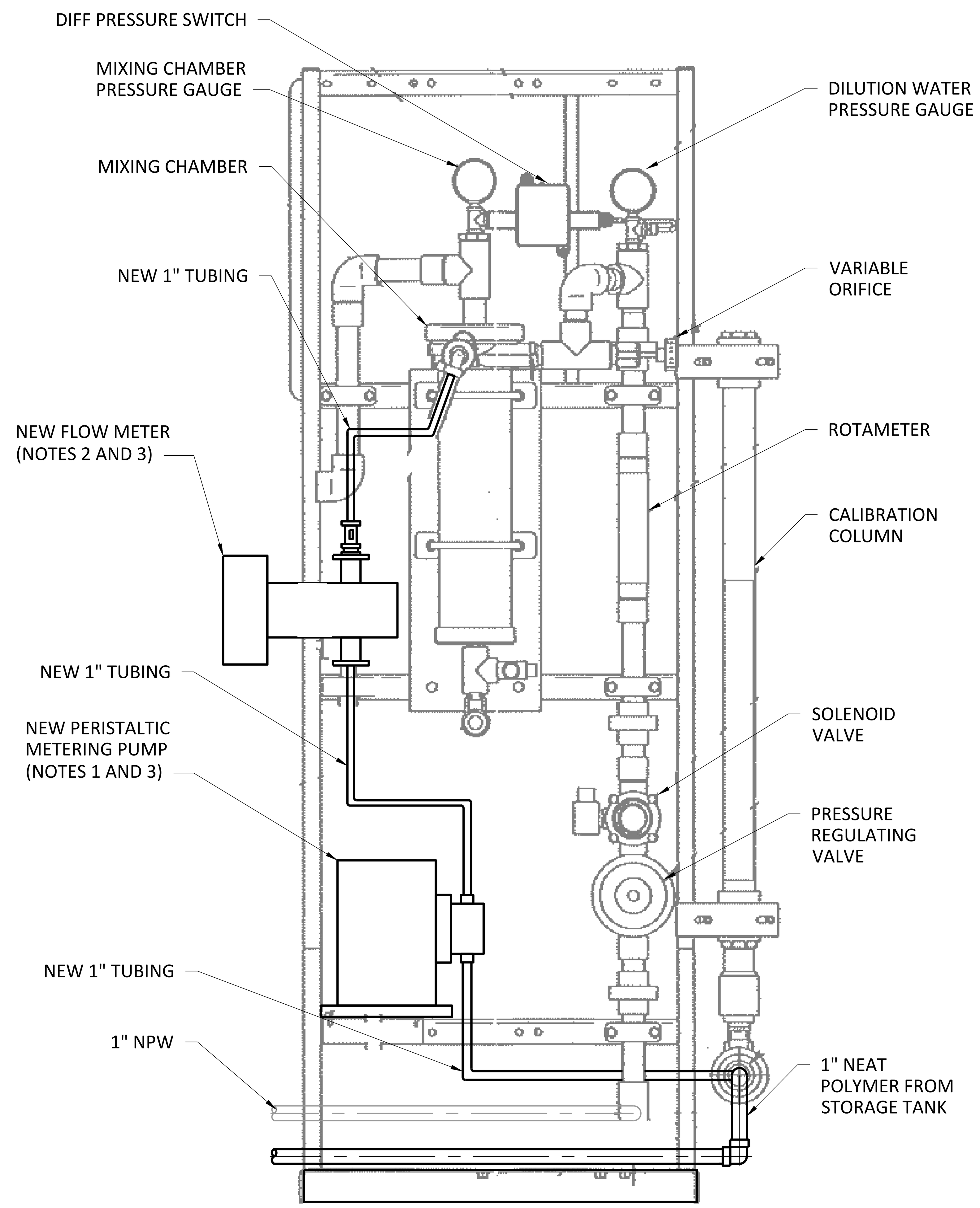
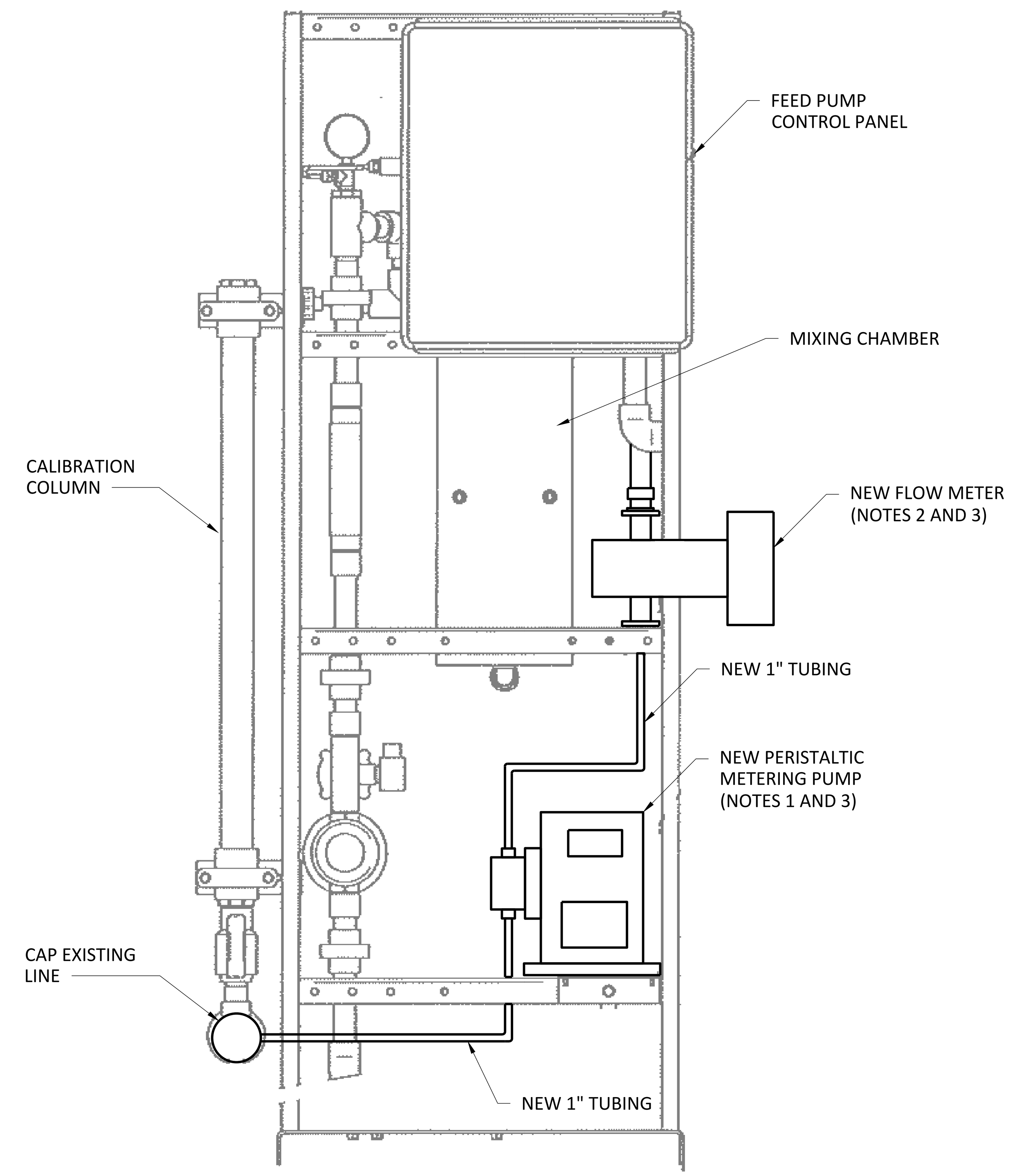
Last Saved: 12/1/2021 2:00 PM Saved By: 04295

Plot Date: 1/26/2022 4:08 PM Plot By: 04295 Filename: N:\WW\WW-CFB-PL-BLDG-PROP.dwg



1 / CB-M-3 POLYMER SYSTEM SKID ELEVATION (FACING SOUTH)

NOT TO SCALE



2 / CB-M-3 POLYMER SYSTEM SKID ELEVATION (FACING NORTH)

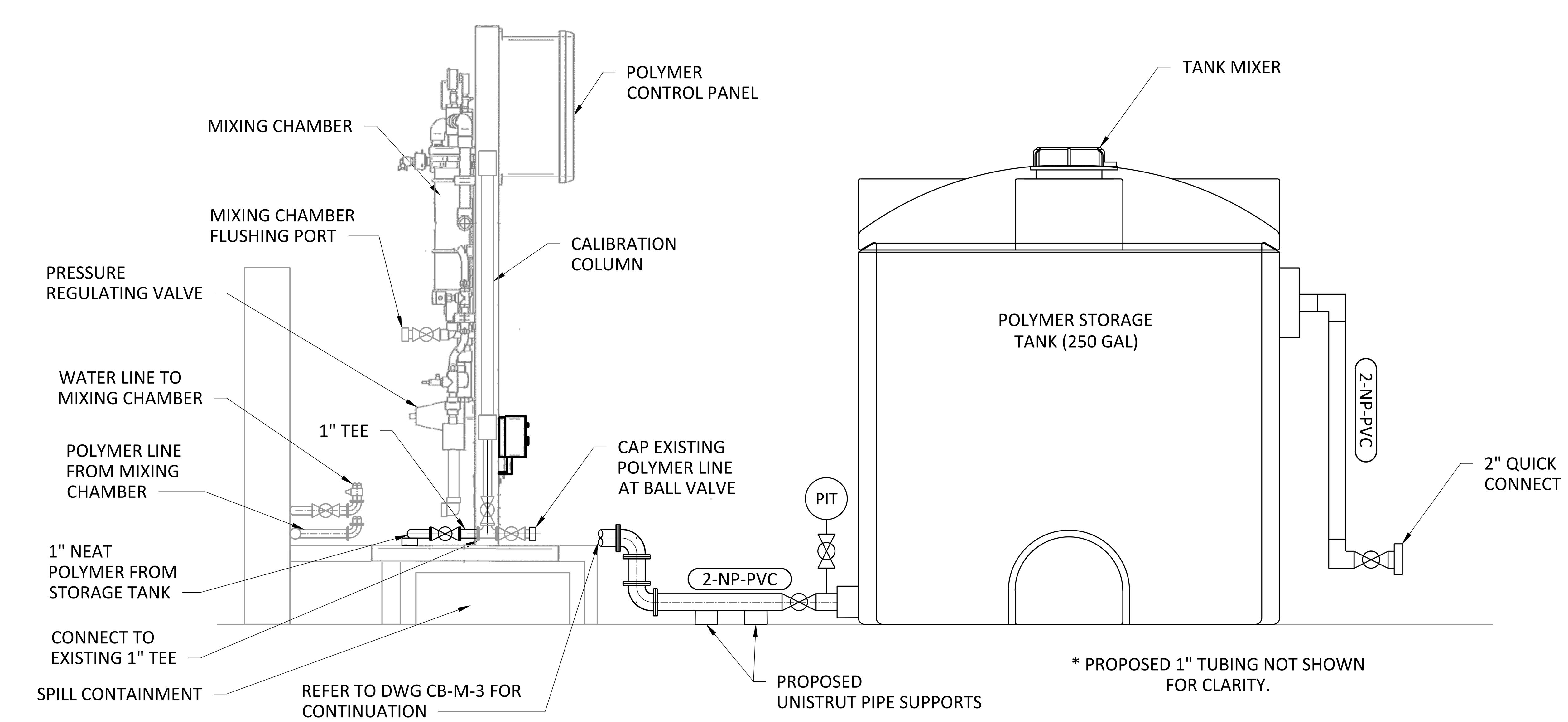
NOT TO SCALE

NOTES:

1. PERISTALTIC METERING PUMP TO BE WATSON MARLOW 20 PU METERING PUMP WITH CAPACITY OF 5.3 GPH AT 100 PSI OR APPROVED EQUAL. PUMP SHALL FACE SOUTH.

2. FLOW METER TO BE 1" ENDRESS+HAUSER PROMAG W 400 OR APPROVED EQUAL.

3. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY SUPPORTS TO AFIX PROPOSED FLOW METER AND PUMP TO EXISTING SKID SUPPORT SYSTEM. SUPPORTS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. NUTS, BOLTS, WASHERS AND ALL EMBEDDED ITEMS SHALL BE TYPE 316 STAINLESS STEEL.



* PROPOSED 1" TUBING NOT SHOWN FOR CLARITY.

3 / CB-M-3 POLYMER SYSTEM SECTION

1" = 1'-0"

0 6" 1' 2'
1"=1'-0"

ISSUED FOR BID

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

STATE OF TEXAS
SOMNATH CHILUKURI
118309
LICENSED PROFESSIONAL ENGINEER
02-01-2022

FREESE AND NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS

MECHANICAL
CHEMICAL FEED BUILDING
POLYMER SYSTEM SECTIONS

NO.	ISSUE	BY	DATE

F&N JOB NO. BMT21704
DATE 01/28/2022
DESIGNED RT
DRAWN CD
REVISED .
CHECKED ####
FILE NAME WW-CFB-PS-EQPT02.dwg

VERIFY SCALE 0 1
Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET CB-M-4

SEQ. 21

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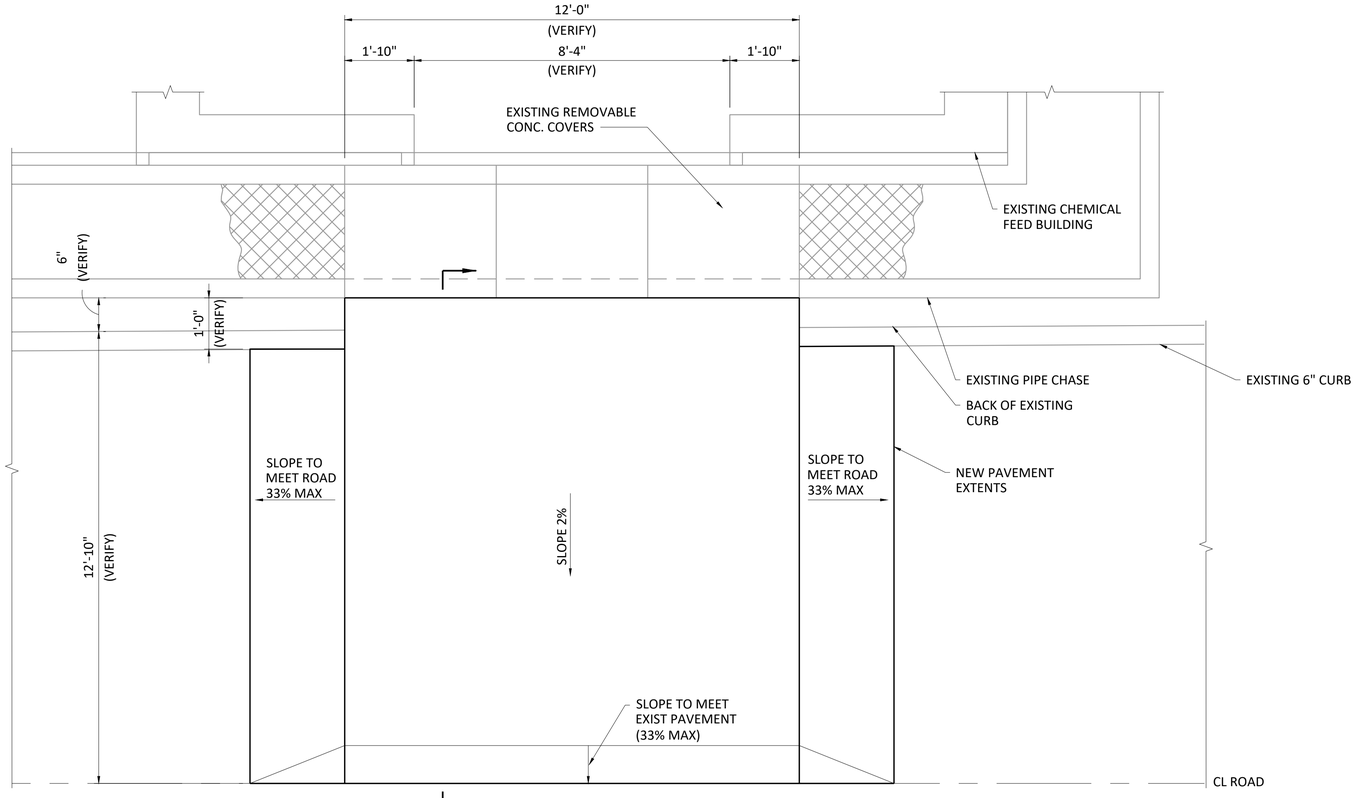


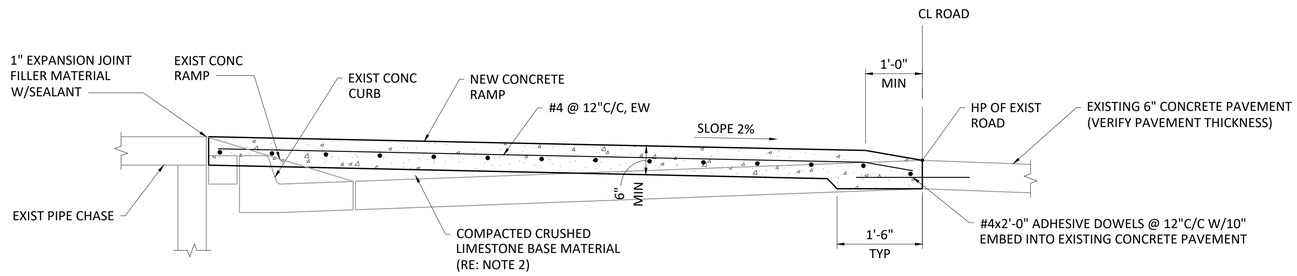
2
-

NORTH

1
-

PLAN

1/2"=1'-0"



NOTES:

1. SAWCUT AND REMOVE EXISTING CONCRETE PAVEMENT, CONCRETE RAMP, AND CONCRETE CURB AS REQUIRED TO CONSTRUCT THE NEW CONCRETE RAMP.
2. PROVIDE MINIMUM 6" COMPACTED BASE MATERIAL BELOW THE NEW CONCRETE RAMP. THE BASE MATERIAL SHALL BE CRUSHED LIMESTONE BASE MATERIAL CONFORMING TO TXDOT STANDARD SPECIFICATION ITEM 247, GRADE 1 OR 2, TYPE A. COMPACT TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 (STANDARD PROCTOR), AND AT A MOISTURE CONTENT WITHIN 1 PERCENT OF OPTIMUM MOISTURE. BACKFILL SHALL BE PLACED IN MAXIMUM 4" LOOSE LIFTS FOR HAND-DIRECTED EQUIPMENT. IN-PLACE FIELD DENSITY TESTS SHALL BE PERFORMED AT A RATE OF ONE TEST PER 1,500 SQUARE FEET FOR EVERY LIFT.

2
-

SECTION

3/4"=1'-0"

0 1' 2' 4'
1/2"=1'-0"

0 6" 1' 2'
3/4"=1'-0

ISSUED FOR BID

Freese and Nichols, Inc
Texas Registered Engineering Firm F-2144

STATE OF TEXAS
MICHAEL RAY ROBERTSON
97012
LICENSED
PROFESSIONAL ENGINEER
01/28/2022

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
STRUCTURAL

CHEMICAL FEED BUILDING ACCESS RAMP PLAN

F&N JOB NO. BMT21704
DATE 01/28/2022
DESIGNED MRR
DRAWN JLM
REVISED
CHECKED PAB
FILE NAME ST-CS-PL-FNDN2.dwg

NO. | ISSUE | BY | DATE

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1

SHEET CB-S-1
SEQ. 22

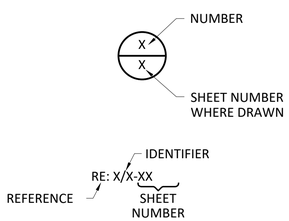
ACAD Rel: 23.0S (LMS Tech)
Filename: N:\ST\ST-CS-PL-FNDN2.dwg
Last Saved: 12/3/2021 9:03 AM Saved By: jaw

Plot Date: 1/27/2022 11:58 AM Plot By: 02856 Filename: N:\ST\ST-CS-PL-FNDN2.dwg

ABBREVIATIONS	
AC	ALTERNATING CURRENT
AF	AMP FRAME
AFD	ADJUSTABLE FREQUENCY DRIVE
AFF	ABOVE FINISHED FLOOR OR GRADE
AG	ABOVE GRADE
AGSB	ABOVE GROUND SPLICE BOX
AIC	AMPERES INTERRUPTING CAPACITY
AL OR ALUM	ALUMINUM
AMP OR A	AMPERE
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE
C.	CONDUIT
CB	CIRCUIT BREAKER
C/C	CENTER TO CENTER
CHH	COMMUNICATION MANHOLE/HANDHOLE
CKT	CIRCUIT
CLF	CURRENT LIMITING FUSE
CONT.	CONTINUATION
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CS	CONTROL SWITCH OR COMBINATION STARTER
CT	CURRENT TRANSFORMER
CU	COPPER
DC	DIRECT CURRENT
DI	DOOR INTERLOCK
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DWG	DRAWING
EMH	ELECTRICAL MANHOLE/HANDHOLE
EC	EMPTY CONDUIT
ELEC	ELECTRICAL
ELEV	ELEVATION
EM	EMERGENCY
EHH	ELECTRICAL MANHOLE
EO	ELECTRICALLY OPERATED
ETM	ELAPSED TIME METER
EUC	ELECTRIC UTILITY CO.
EXIST.	EXISTING
FBO	FURNISHED BY OTHERS
FO	FIBER OPTIC
FRP	FIBERGLASS REINFORCED POLYESTER
FT	FEET
FU	FUSE
G. OR GRD	GROUND
GA.	GAUGE
GCP	GENERATOR CONTROL PANEL
GEN	GENERATOR
GFI	GROUND FAULT INTERRUPTER
GFS	GROUND FAULT SENSING
GO	GATE OPERATOR
GRS	GALVANIZED RIGID STEEL
HH	HANDHOLE
HP	HORSEPOWER
HT	HEIGHT
HTP	HEAT TRACE PANEL
HTR	HEATER
HZ	HERTZ
ID	INTERNAL DIAMETER
IMH	INSTRUMENT MANHOLE
INST	INSTRUMENT
IRP	INTERPOSING RELAY PANEL
JB	JUNCTION BOX
KAIC	KILO AMPERE INTERRUPTING CAPACITY
KVA	KILOVOLT-AMPERE
KW	KILOWATT
LA	LIGHTNING ARRESTER
LC	LIGHTNING CONTACTOR
LED	LIGHT EMITTING DIODE
LGTS ON LTG	LIGHTS/LIGHTING
LP	LIGHTING PANEL
LSI	LONG, SHORT, INSTANTANEOUS
LSIG	LONG, SHORT, INSTANTANEOUS, GROUND
MBFV	MOTOR OPERATED BUTTERFLY VALVE
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MFR	MANUFACTURER
MFR'S	MANUFACTURER'S
MH	MANHOLE
ML	MULTILIN
MOV	MOTOR OPERATED VALVE
MLO	MAIN LUGS ONLY
MPR	MOTOR PROTECTION RELAY
MR	MULTIRATIO
MTD	MOUNTED
MTG	MOUNTING
MTS	MANUAL TRANSFER SWITCH

ABBREVIATIONS	
NC or N.C.	NORMALLY CLOSED
NF	NON-FUSED
NO or N.O.	NORMALLY OPEN OR NUMBER
NO.	NUMBER
OD	OUTSIDE DIAMETER
OHE	OVERHEAD ELECTRIC
OL	OVERLOAD
OLX	OVERLOAD CONTROL RELAY
P	POLE
PB	PULL BOX OR PUSH BUTTON
PC	PHOTOCELL
PCC	PUMP CONTROL CONSOLE
PFCC	POWER FACTOR CORRECTION CAPACITOR
PFR	PHASE FAILURE RELAY
PH	PHASE
PL.	PLATE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PoE	POWER OVER ETHERNET
PPR	PHASE PROTECTIVE RELAY
PQM	POWER QUALITY METER
PR.	PAIR OR PAIR CABLE
PT	POTENTIAL TRANSFORMER
PTT	PUSH TO TEST TYPE
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
RC	REMOTE CONTROL
RCP	RELAY CONTROL PANEL
REC.	CIRCUIT RECLOSURE
RECP	RECEPTACLES
REQD.	REQUIRED
RTD	RESISTANCE TEMPERATURE DETECTOR
RTU	REMOTE TERMINAL UNIT
SC	SURGE CAPACITOR
SCH	SCHEMATIC
SCTB	SHORT CIRCUIT TERMINAL BLOCK
SEC	SECONDS OR SECONDARY
SHLD. OR SH	SHIELD OR SHIELDED
SHT	SHEET
SN OR S/N	SOLID NEUTRAL
SPD	SURGE PROTECTION DEVICES
SSRVS	SOLID-STATE REDUCED VOLTAGE STARTER
SS	STAINLESS STEEL
ST	STARTER
STA.	STATION
STC	SIGNAL TERMINATION CABINET
SV	SOLENOID VALVE
SW	SWITCH
SWGR	SWITCHGEAR
Sz#	MOTOR STARTER WITH SIZE
TC	TERMINATION CABINET OR TRAY CABLE
TEL	TELEPHONE
TO	TIME DELAY ON OPENING
TR.	TRIAD
TS	TEMPERATURE SWITCH
TW	TWISTED
TYP	TYPICAL
UG	UNDERGROUND
UPS	UNINTERRUPTIBLE POWER SUPPLY
UTP	UNSHIELDED TWISTED PAIR CABLE
V	VOLTS
VAR.	VARIABLE
VFD	VARIABLE FREQUENCY DRIVE
VFI	VACUUM FAULT INTERUPTER
VO	VALVE OPERATOR
W	WITH, WIRE OR WATT
WP	WEATHERPROOF
WR	WEATHER RESISTANT
XFMR	TRANSFORMER
XMTR	TRANSMITTER
XP	EXPLOSION PROOF

NOTE:
THIS IS A STANDARD LEGEND. THEREFORE, NOT ALL OF THIS INFORMATION MAY BE USED ON THIS PROJECT.



PLAN SYMBOL	DESCRIPTION
b A	LIGHTING FIXTURE "A" - FIXTURE TYPE "b" - SWITCH NUMBER
A	EMERGENCY BATTERY PACK LIGHT FIXTURE "A" - FIXTURE TYPE
X	CEILING MOUNTED EXIT SIGN "X" - FIXTURE TYPE
X	WALL MOUNTED EXIT SIGN ARROW INDICATES DIRECTION OF EGRESS "X" - FIXTURE TYPE
FACP	FIRE ALARM CONTROL PANEL
F	MANUAL PULL STATION
	CEILING MOUNTED STROBE
	WALL MOUNTED STROBE
	SMOKE DETECTOR
	HEAT DETECTOR
	HORN
	COMBINATION STROBE/HORN
	CONDUIT, EXPOSED/SURFACE MOUNTED
	CONDUIT OR DUCTBANK, CONCEALED
	CONDUIT, EXPOSED/SURFACE MOUNTED, TURNING UP
	CONDUIT, EXPOSED/SURFACE MOUNTED, TURNING DOWN
	CONDUIT STUBBED OUT AND CAPPED
OHE	OVERHEAD ELECTRIC LINE
UGE	UNDERGROUND ELECTRIC LINE
OHP	OVERHEAD PRIMARY LINE
UGP	UNDERGROUND PRIMARY LINE
OHS	OVERHEAD SECONDARY LINE
UGS	UNDERGROUND SECONDARY LINE
OHC	OVERHEAD COMMUNICATION LINE
UGC	UNDERGROUND COMMUNICATION LINE
OHFO	OVERHEAD FIBER OPTIC LINE
UGFO	UNDERGROUND FIBER OPTIC LINE
	FLEXIBLE METAL CONDUIT
	HEAT TRACE
2 (3 #3/0, #2G., 3"C.)	DENOTES A QUANTITY OF TWO (2) 3-INCH CONDUITS EACH CONTAINING THREE NO. 3/0 AWG CONDUCTORS AND ONE NO.2 AWG GROUND CONDUCTOR
2-2/C#16	DENOTES A QUANTITY OF TWO INSTRUMENT CABLES. EACH CONSISTS OF TWO NO.16 AWG CONDUCTORS
3-4"C	THREE 4-INCH CONDUITS
MC1-XXX 4 #14, #14G., ¾"C. (2#14 SPARE)	CABLE TAG FOUR #14 CONTROL OR POWER CONDUCTORS, ONE #14 GROUND CONDUCTOR. ALL CONDUCTORS IN A ¾" CONDUIT. TWO OF THE FOUR #14 CONTROL OR POWER CONDUCTORS ARE SPARE.
LA-1,3	HOMERUN, CIRCUITS 1 AND 3 RUN TO PANEL LA 2 #12, #12G., 3/4"C. UNLESS NOTED OTHERWISE
$b	SINGLE POLE SWITCH "b" - INDICATES SWITCH LEG SHALL CONTROL LIGHT FIXTURES WITH "b" - DESIGNATION
$Xc	MULTI POLE SWITCH "x" - INDICATES NUMBER OF POLE "c" - INDICATES SWITCH SHALL CONTROL LIGHT FIXTURES WITH "c" DESIGNATION
$M	MANUAL MOTOR STARTER /DISCONNECT
$3	3 WAY SWITCH
$4	4 WAY SWITCH
$D D	DIMMER LIGHTING CONTROL SWITCH
$TM TM	TIME SWITCH
	DUPLEX RECEPTACLE, 20A, 120V, 2P, 3W "C" - MOUNTED ABOVE COUNTERTOP "GFI" OR "GF" - GROUND FAULT INTERRUPTER TYPE "WP" - WEATHERPROOF
F	FLOOR MOUNTED RECEPTACLE
	SIMPLEX RECEPTACLE, GROUNDED TYPE
	QUADPLEX RECEPTACLE

PLAN SYMBOL	DESCRIPTION
J J	JUNCTION BOX
PB	PULL BOX
TC	TERMINAL CABINET
OS	OCCUPANCY SENSOR
PC	PHOTOCELL
PW	PREWIRED
MH	MANHOLE
M	UTILITY METER
M	MOTORIZED LOUVER
DAMP	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE OF NEMA 12 CONSTRUCTION UNLESS OTHERWISE NOTED
WET	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE OF NEMA 4 CONSTRUCTION UNLESS OTHERWISE NOTED
CORROSIVE	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL BE OF NEMA 4X CONSTRUCTION UNLESS OTHERWISE NOTED
CLASS I, DIV.1, GROUP D	INDICATES THAT ALL ELECTRICAL EQUIPMENT AND MATERIALS INSTALLED WITHIN THE ROOM OR AREA IN WHICH THIS NOTATION APPEARS SHALL CONFORM TO N.E.C REQUIREMENTS FOR THE HAZARDOUS AREA CLASSIFICATION SHOWN

ONE-LINE OR CONTROL DIAGRAM	PLAN	DESCRIPTION
	OR	PANEL
5	M	MOTOR, NUMBER DESIGNATES HORSEPOWER
VM ✳	-	VOLTMETER (WITH SWITCH IF 3-PHASE)
AM ✳	-	AMMETER (WITH SWITCH IF 3-PHASE)
✳	-	METER ✳ WM - WATTMETER WHM - WATTHOUR METER WHDM - WATTHOUR DEMAND METER WHDR - WATTHOUR DEMAND RECORDER PF - POWER FACTOR METER ETM - ELAPSED TIME METER TRANSDUCER AX - CURRENT TRANSDUCER WX - WATT TRANSDUCER
#	-	RELAY, NO. AS INDICATED 25 - SYNCHRONISM CHECK RELAY 27 - UNDER VOLTAGE RELAY 38 - BEARING PROTECTIVE DEVICE 40 - LOSS OF EXCITATION RELAY 42 - RUNNING CONTACTOR/PILOT RELAY 46 - REVERSE PHASE/PHASE BALANCE/CURRENT RELAY 47 - PHASE SEQUENCE VOLTAGE RELAY 48 - MACHINE OR TRANSFORMER THERMAL RELAY 50 - INSTANTANEOUS OVERCURRENT RELAY 50G - INSTANTANEOUS GROUND 51 - TIME OVER CURRENT RELAY, GROUNDING RESISTOR TYPE 51N - TIME OVERCURRENT RELAY, RESIDUAL TYPE 51V - TIME OVERCURRENT RELAY WITH VOLTAGE RESTRAINT 59 - OVER VOLTAGE RELAY 60 - NEGATIVE SEQUENCE VOLTAGE RELAY 62 - TIME DELAY RELAY 63 - OVER PRESSURE RELAY 67 - AC DIRECTIONAL OVERCURRENT RELAY 83 - AUTOMATIC SELECTIVE CONTROL OR TRANSFER RELAY 86 - LOCKING-OUT RELAY 87 - DIFFERENTIAL PROTECTIVE RELAY B - SUFFIX INDICATES "BUS" G - SUFFIX INDICATES "GENERATOR" GF - GROUND FAULT IR - INTERPOSING RELAY PFR - PHASE FAILURE, PHASE REVERSAL, UNDERVOLTAGE, OVERVOLTAGE RELAY ST - SHUNT TRIP T - SUFFIX INDICATES "TRANSFORMER" TRP CAP - CAPACITOR TRIP X - SUFFIX INDICATES "AUXILIARY"

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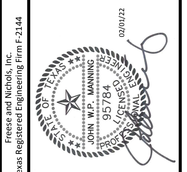

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
ELECTRICAL

LEGEND I

F&N JOB NO.	BMT21704		
DATE	01/28/2022		
DESIGNED	HW		
DRAWN	HW		
REVISED	-		
CHECKED	JWM		
FILE NAME	EL-ALL-GN-LGND01_Fl.dwg		
NO.	ISSUE	BY	DATE

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VERIFY SCALE 0 1"

SHEET E-1
SEQ. 23

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Plot Date: 2/1/2022 1:55 PM Plot By: 02789 Filename: N:\ELEC\#1 - FLOOD IMPROVEMENTS\EL-ALL-GN-LGND01_Fl.dwg

ONE-LINE OR CONTROL DIAGRAM	PLAN	DESCRIPTION
CR#	-	AC INDUSTRIAL CONTROL RELAY COIL, # - NUMBER AS INDICATED
M#	-	MOTOR STARTER COIL, # - NUMBER AS INDICATED
✳	-	SPECIAL CAPACITOR ✳SC - SURGE CAPACITOR PF - POWER FACTOR CORRECTION CAPACITOR
	-	PUSH BUTTON, MOMENTARY CONTACT, SPRING RETURN, NORMALLY CLOSED
	-	PUSH BUTTON, MOMENTARY CONTACT, SPRING RETURN, NORMALLY OPEN
	-	EMERGENCY STOP PUSH BUTTON WITH RED MUSHROOM HEAD OPERATOR (MAINTAINED CONTACT)
OFF ON	-	OFF/ON SELECTOR SWITCH
B A C X00 00X	-	3 POSITION SELECTOR SWITCH, MAINTAINED CONTACT O-OPEN X-CLOSED POSITION / TOP CONTACT / MIDDLE CONTACT / BOTTOM CONTACT A / X / O / O B / 0 / O / O C / 0 / O / X (A/B/C) HOA - HAND/OFF/AUTO HOR - HAND/OFF/REMOTE LOR - LOCAL/OFF/REMOTE OCS - OPEN/CLOSE/STOP OOA - ON/OFF/AUTO NOTE: 2 POSITION MULTI-CONTACT SWITCH FOLLOWS SAME CONVENTION
PTT	-	INDICATING LAMP, COLOR INDICATED ✳R - RED G - GREEN B - BLUE W - WHITE A - AMBER O - ORANGE PTT - PUSH TO TEST
52	-	MEDIUM VOLTAGE DRAWOUT TYPE POWER CIRCUIT BREAKER
AF AT A P	CB	LOW VOLTAGE CIRCUIT BREAKER, 3 POLE UNLESS OTHERWISE NOTED A - AMP TRIP, P - POLES
MCP		MOTOR CIRCUIT PROTECTOR
MCP ✳ Sz#	⊠	COMBINATION MOTOR CIRCUIT PROTECTOR AND MAGNETIC MOTOR STARTER, FULL VOLTAGE NON-REVERSING UNLESS OTHERWISE NOTED: ✳FVR - FULL VOLTAGE REVERSING FVNR - FULL VOLTAGE, NON REVERSING RVNR - REDUCED VOLTAGE NON-REVERSING 2S1W - TWO SPEED, ONE WINDING 2S2W - TWO SPEED, TWO WINDING Sz# - NEMA SIZE OF STARTER
✳	⊡	NON-FUSIBLE DISCONNECT SWITCH, 600 VOLT, 3 POLE ✳AMPERE RATING NOTED
✳ ✱	⊡	FUSIBLE DISCONNECT SWITCH, 600 VOLT, 3 POLE, AMPERE RATING AND FUSE SIZE AS NOTED ✳AMPERE RATING NOTED ✱FUSE RATING
	-	DRAWOUT TYPE EQUIPMENT OR DEVICE
	-	MEDIUM VOLTAGE CABLE TERMINATION
	-	MEDIUM VOLTAGE AIR INTERRUPTER SWITCH
	-	MEDIUM VOLTAGE FUSED AIR INTERRUPTER SWITCH
	-	MEDIUM VOLTAGE FUSED MOTOR CONTROLLER FUSED CONTACTOR DRAWOUT TYPE
VAC	-	VACUUM CONTACTOR
	-	SPEED POTENTIOMETER

ONE-LINE OR CONTROL DIAGRAM	PLAN	DESCRIPTION
TR#		TIMING RELAY RANGE AS NOTED, SET POINT AS NOTED #-NUMBER AS INDICATED TDD-TIME DELAY AFTER DE-ENERGIZATION-OFF DELAY TDE-TIME DELAY AFTER ENERGIZATION-ON DELAY
	-	NOTC-NORMALLY OPEN, TIMED CLOSING WHEN ENERGIZED NCTO-NORMALLY CLOSED, TIMED OPENING WHEN ENERGIZED NOTO-NORMALLY OPEN, TIMED OPENING WHEN DE-ENERGIZED NCTC-NORMALLY CLOSED, TIMED CLOSING WHEN DE-ENERGIZED
✳ -##	✳ -## ⊗	FIELD INSTRUMENT, TAG NO. OR LOOP NO. AS INDICATED ✳ - INDICATES INSTRUMENT TYPE DEFINED ON LOOP SHEETS ## - INDICATES LOOP NO.
	OR ⊗	LIQUID LEVEL (FLOAT) SWITCH NORMALLY CLOSED, OPENS ON FALLING LEVEL NORMALLY OPEN, CLOSES ON FALLING LEVEL NORMALLY CLOSED, OPENS ON RISING LEVEL NORMALLY OPEN, CLOSES ON RISING LEVEL
	PS OR ⊗	PRESSURE OR VACUUM SWITCH NORMALLY OPEN, CLOSES ON RISING PRESSURE NORMALLY CLOSED, OPENS ON RISING PRESSURE NORMALLY OPEN, CLOSES ON DROPPING PRESSURE NORMALLY CLOSED, OPENS ON DROPPING PRESSURE
	T OR TS OR ⊗	TEMPERATURE SWITCH OR THERMOSTAT NORMALLY OPEN, CLOSES ON RISING TEMPERATURE NORMALLY OPEN, CLOSES ON DROPPING TEMPERATURE NORMALLY CLOSED, OPENS ON RISING TEMPERATURE NORMALLY CLOSED, OPENS ON DROPPING TEMPERATURE
	FS OR ⊗	FLOW SWITCH (AIR, WATER, ETC.) NORMALLY OPEN, CLOSES ON INCREASED FLOW NORMALLY CLOSED, OPENS ON INCREASED FLOW
	ZS OR ⊗	POSITION (LIMIT) SWITCH NORMALLY OPEN NORMALLY OPEN - HELD CLOSED NORMALLY CLOSED NORMALLY CLOSED - HELD OPEN
	TQ OR ⊗	TORQUE SWITCH NORMALLY CLOSED, OPENS ON HIGH TORQUE
	T	TRANSFORMER, RATINGS AND CONNECTIONS AS NOTED
#CT'S A	-	CURRENT TRANSFORMER # - QUANTITY A - RATIO
#PT'S	-	POTENTIAL TRANSFORMER # - QUANTITY
#CT'S A	-	GROUND CURRENT SENSOR TRANSFORMER # - QUANTITY A - RATIO
	-	CONTROL TRANSFORMER
	-	CONTROL POWER TRANSFORMER
Y OR G	-	GENERATOR, RATINGS AND CONNECTIONS AS NOTED
#A ATS-1 N S	-	TRANSFER SWITCH ATS - AUTOMATIC TRANSFER SWITCH MTS - MANUAL TRANSFER SWITCH "N" - INDICATES NORMAL SOURCE "S" - INDICATES STANDBY SOURCE #A - INDICATES CONTINUOUS CURRENT RATING
	-	MOTOR OVERLOAD OVERLOAD RELAY HEATER

SYMBOL	DESCRIPTION
▽	DATA
▼	TELEPHONE
▽▼	COMBINATION TELEPHONE/DATA
▼	FLOOR MOUNTED DATA OUTLET
▼	FLOOR MOUNTED TELEPHONE OUTLET
▼	POKE-THRU DEVICE COMBINATION POWER/DATA/VOICE OUTLET
▼	FLOOR COMBINATION POWER/DATA/VOICE OUTLET
	CATV
✳	SECURITY CAMERA ✳F - FIXED Z - PAN/TILT/ZOOM
##	SECURITY DEVICE SEC - SECURITY PANEL MAG - MAGNETIC LOCK CR - CARD READERS DR - REMOTE DOOR RELEASE MD - MOTION DETECTOR SK - SECURITY KEYPAD ES - ELECTRIC STRIKE DS - DOOR SWITCH IC - INTERCOM STATION SB - SECURITY PANIC BUTTON

NOTE:
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ONE-LINE OR CONTROL DIAGRAM	PLAN	DESCRIPTION
	-	CONDUCTORS OR CONDUITS CROSSING PATHS BUT NOT CONNECTED
	-	CONDUCTORS ELECTRICALLY CONNECTED
	-	INDICATES LIMITS OF EQUIPMENT OR WIRING ENCLOSURE
LA	-	LIGHTNING ARRESTER
	G ⊚	GROUND ROD GROUND ROD TEST WELL
30A	-	FUSE, AMPERE RATING AS NOTED
	-	HEATER
	-	INDUCTOR
	-	CONTACT, NORMALLY OPEN (NO)
	-	CONTACT, NORMALLY CLOSED (NC)
OL	-	OVERLOAD CONTACT
K OR K	-	KIRK KEY INTERLOCK
	-	MECHANICAL INTERLOCK
	-	TERMINAL
	-	NODE
TB	-	TERMINAL OR TEST BLOCK
OR	-	PUSH BUTTON STATION, REFER TO ELECTRICAL SCHEMATIC FOR NUMBER OF DEVICES.
	-	LOCATED AT SCADA RTU
	-	LOCATED REMOTE
	-	LOCATED AT MOTOR
	-	FUSED SWITCH/FUSED CUTOUT
M	M	UTILITY METER

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
ELECTRICAL

LEGEND II

NO.	ISSUE	BY	DATE

F&N JOB NO. BMT21704
DATE 01/28/2022
DESIGNED HW
DRAWN HW
REVISED -
CHECKED JWM
FILE NAME EL-ALL-GN-LGND02_FI.dwg

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SEQ. 24

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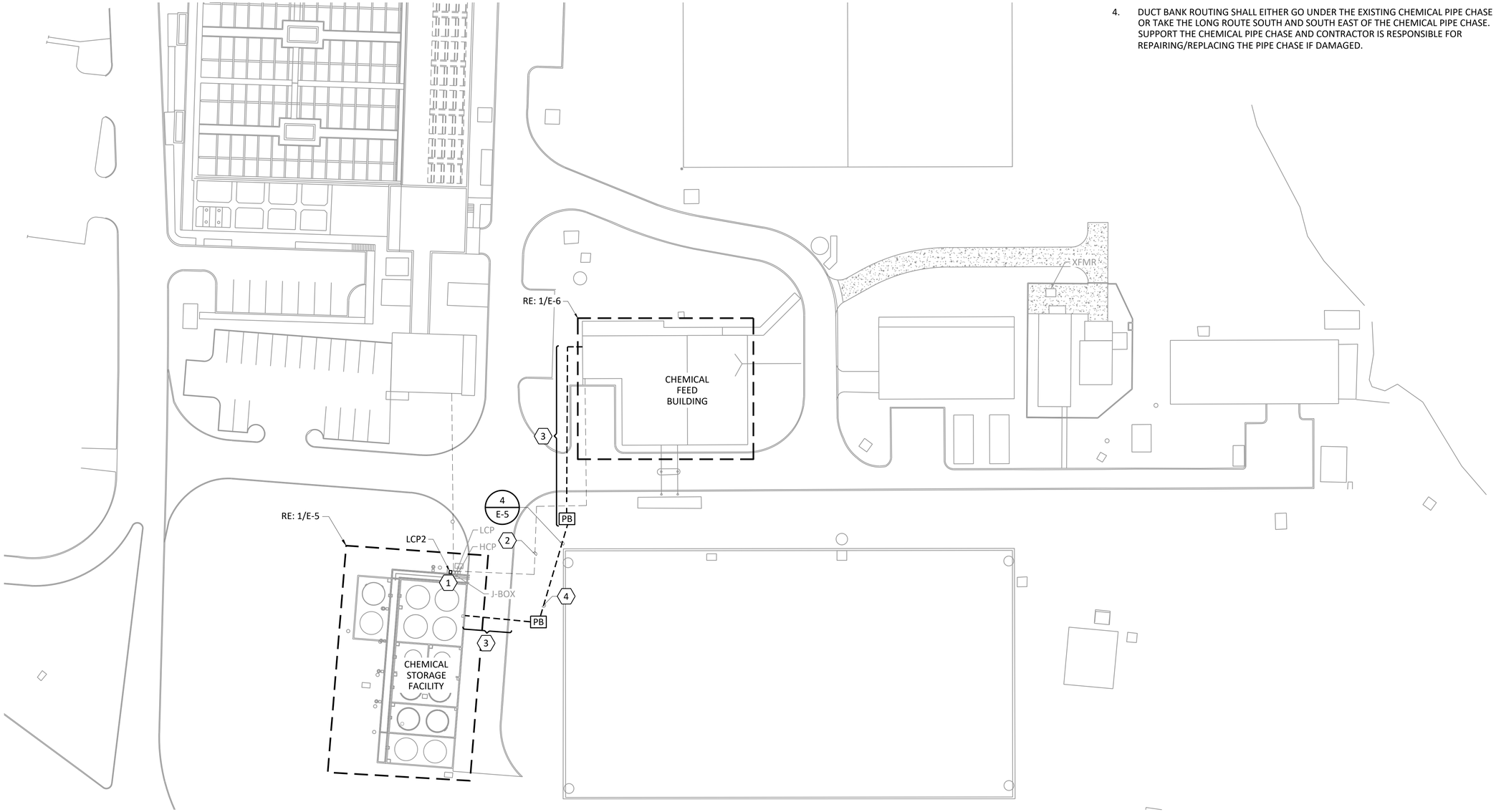
Plot Date: 2/1/2022 1:56 PM Plot By: 02789 Filename: N:\ELEC\#1 - FLOOD IMPROVEMENTS\EL-ALL-GN-LGND02_FI.dwg

GENERAL NOTES:

1. CONDUIT DUCT BANK ROUTES INDICATED ON DRAWINGS ARE APPROXIMATE. CONTRACTOR WILL BE RESPONSIBLE TO VERIFY EXISTING ACTUAL LOCATION BY EITHER POTHOLING OR LOCATION SERVICES. PROPOSED CONDUIT ROUTES ARE APPROXIMATE AND ARE SUBJECT TO CHANGE BASED ON ACTUAL SITE CONDITIONS.

NOTES BY SYMBOL "⬡"

1. PROVIDE OVERHEAD CONDUIT RACK FROM EQUIPMENT RACK TO TANK FARM CONCRETE STRUCTURE. ROUTE CONDUITS OUTSIDE THE CONTAINMENT AREA PAST THE CHEMICAL PIPE CHASE.
2. EXISTING CONDUIT ROUTE SHOWN IS APPROXIMATE. CONTRACTOR MAY NEED TO FIELD LOCATE TO AVOID DAMAGE.
3. CONTRACTOR IS REQUIRED TO CUT CONCRETE AND PATCH BACK TO MATCH EXISTING. SEQUENCE CONCRETE CUT AND PATCH REPAIRS TO ELIMINATE CONFLICT WITH CHEMICAL DELIVERIES TO THE CHEMICAL BUILDING. CONTRACTOR SHALL COORDINATE WITH OWNER.
4. DUCT BANK ROUTING SHALL EITHER GO UNDER THE EXISTING CHEMICAL PIPE CHASE OR TAKE THE LONG ROUTE SOUTH AND SOUTH EAST OF THE CHEMICAL PIPE CHASE. SUPPORT THE CHEMICAL PIPE CHASE AND CONTRACTOR IS RESPONSIBLE FOR REPAIRING/REPLACING THE PIPE CHASE IF DAMAGED.



1 / - PROPOSED SITE PLAN

1" = 400'

N

0 400' 800'

SCALE IN FEET

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Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

STATE OF TEXAS
JOHN W. P. MANNING
95784
LICENSED PROFESSIONAL ENGINEER
02/10/22

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS

PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS

ELECTRICAL

PROPOSED SITE PLAN

NO.	ISSUE	BY	DATE

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0 1"

F&N JOB NO.	BMT21704
DATE	01/28/2022
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FILE NAME	EL-STE-PL-PROP_FI.dwg

SHEET E-3

SEQ. .

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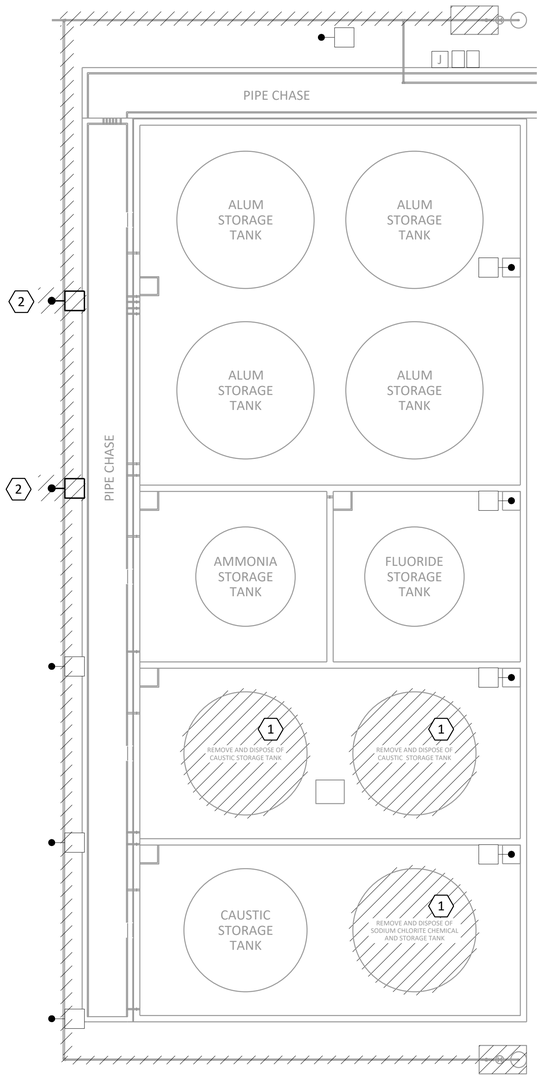

1 / - CHEMICAL STORAGE FACILITY DEMOLITION PLAN

1/8" = 1'-0"

GENERAL NOTES:

1. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF ALL EQUIPMENT, CONDUCTORS AND CONDUIT TO BE DEMOLISHED.

NOTES BY SYMBOL "⬡"

1. DEMOLISH EXISTING LEVEL SENSORS, LEVEL TRANSMITTERS AND ALL ASSOCIATED ELECTRICAL CONDUCTORS AND CONDUIT.
2. LIGHT FIXTURE AND LIGHT POLE TO BE RELOCATED. RE: 1/E-5 FOR PROPOSED RELOCATION OF LIGHT FIXTURE AND LIGHT POLE.

NORTH

0 4' 8' 16'

1/8"=1'-0"

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Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

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FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
ELECTRICAL
CHEMICAL STORAGE FACILITY DEMOLITION PLAN

NO.	ISSUE	BY	DATE

F&N JOB NO. BMT21704
DATE 01/28/2022
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SHEET E-4

SEQ. 26

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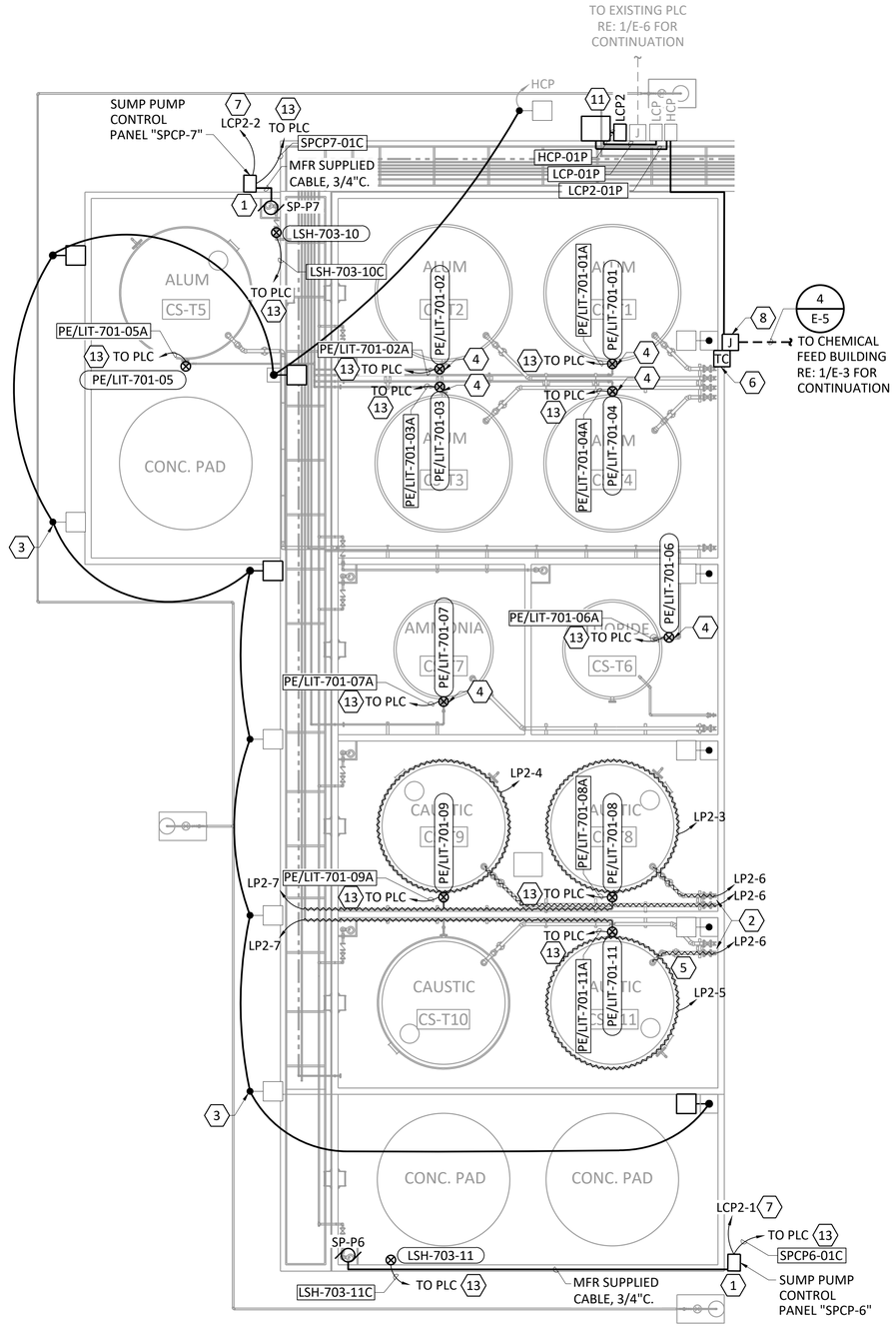
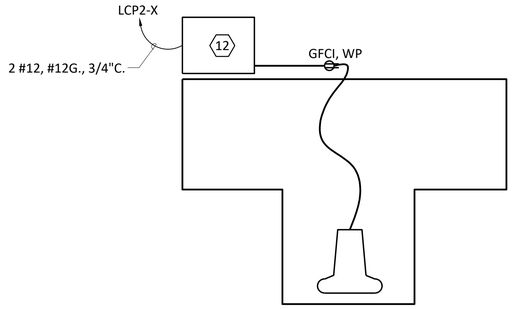


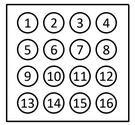
CHEMICAL STORAGE FACILITY PROPOSED PLAN

1/8" = 1'-0"



SUMP PUMP DETAIL

NOT TO SCALE



1	SPARE	2"C.
2	PIT-701-10A	2"C.
3	SPCP7-01C, SPCP6-01C, LSH-701-10C, LSH-701-12C	4"C.
4	PE/LIT-701-01A, PE/LIT-701-02A	2"C.
5	PE/LIT-701-03A, PE/LIT-701-04A	2"C.
6	PE/LIT-701-05A, PE/LIT-701-06A	2"C.
7	PE/LIT-701-07A, PE/LIT-701-08A	2"C.
8	PE/LIT-701-09A, PE/LIT-701-11A	2"C.
14	SPARE	2"C.
15	SPARE	2"C.
16	SPARE	2"C.

DUCT BANK DETAIL

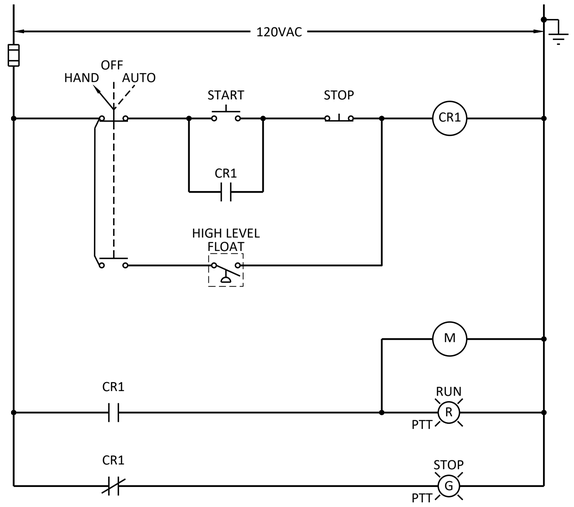
NOT TO SCALE

GENERAL NOTES:

1. POWER, DISCRETE, AND ANALOG CONDUCTORS SHALL BE ROUTED IN SEPARATE CONDUITS.
2. CONDUIT ROUTES INDICATED ON DRAWINGS ARE APPROXIMATE. CONTRACTOR WILL BE RESPONSIBLE TO VERIFY EXISTING ACTUAL LOCATION.
3. ALL CONTROL PANELS, JUNCTION BOXES AND PULL BOXES SHALL BE ACCESSIBLE FROM OUTSIDE THE TANK FARM WALLS.
4. ALL RECEPTACLES AND OUTLETS WITHIN CONTAINMENT AREA TO BE AT LEAST 3'-0" ABOVE FINISHED FLOOR.
5. DO NOT ROUTE CONDUIT ON CONTAINMENT AREA FINISHED FLOOR TO AVOID TRIPPING HAZARD. ALL CONDUIT MUST BE ROUTED ALONG THE INSIDE OR OUTSIDE OF CONTAINMENT AREA WALLS OR 3'-0" ABOVE CONTAINMENT AREA FINISHED FLOOR BY 316 STAINLESS STEEL CONDUIT SUPPORTS.

NOTES BY SYMBOL "⬡"

1. CONTROL PANELS TO BE PLACED ON UNISTRUT OUTSIDE TANK FARM WALLS. RE: 3/E-5 FOR DETAILS.
2. PROVIDE HEAT PADS AND CONTROLLER FOR ALL CAUSTIC TANKS AND 3 W/FT HEAT TRACE AND CONTROLLER FOR CAUSTIC PIPING.
3. DESIGNATED RELOCATED LIGHT POLE. CONTRACTOR TO PROVIDE NEW CONCRETE BASE FOR POLE.
4. INSTALL PE/LIT DISPLAY OUTSIDE CONTAINMENT AREA WALL SO VISIBLE BY OPERATORS WITHOUT HAVING TO GO INSIDE CONTAINMENT AREA.
5. REWORK HEAT TRACING ON CHEMICAL PIPE TRANSMITTERS WITH TANK MANUFACTURER.
6. PROVIDE TERMINATION CABINET FOR ALL ANALOG AND DISCRETE SIGNALS TO BE ROUTED THROUGH. MOUNT TO TOP OF CONCRETE CONTAINMENT WALL.
7. PROVIDE 2 #12, #12G., 3/4"C. TO PANELBOARD.
8. RE: 3/E-11 FOR MOUNTING DETAIL. DO NOT PENETRATE TOP OF JUNCTION BOX.
9. NOT USED.
10. NOT USED.
11. PROVIDE NEW TRANSFORMER AND PANELBOARD LCP2. EXTEND EQUIPMENT RACK TO ACCOMMODATE NEW PANELBOARD. PROVIDE 4" CONCRETE FOUNDATION EXTENDING 1'-0" PAST TRANSFORMER ENCLOSURE. DO NOT PENETRATE TOP OF EQUIPMENT.
12. PROVIDE 304 STAINLESS STEEL EQUIPMENT RACK FOR ENCLOSURE.
13. PLC LOCATED IN CHEMICAL FEED BUILDING. RE: 1/E-6.



SUMP PUMP CONTROL SCHEMATIC

NOT TO SCALE

NORTH

0 4' 8' 16'

1/8"=1'-0"

ISSUED FOR BID

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

02/01/22

FREESE NICHOLS

11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS

ELECTRICAL

CHEMICAL STORAGE FACILITY PROPOSED PLAN

NO.	ISSUE	BY	DATE

R&N JOB NO. BMT21704
DATE 01/28/2022
DESIGNED HW
DRAWN HW
REVISED -
CHECKED JWM
FILE NAME EL-CFS-PL-PROP_FI.dwg

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1"

SHEET E-5

SEQ. 27

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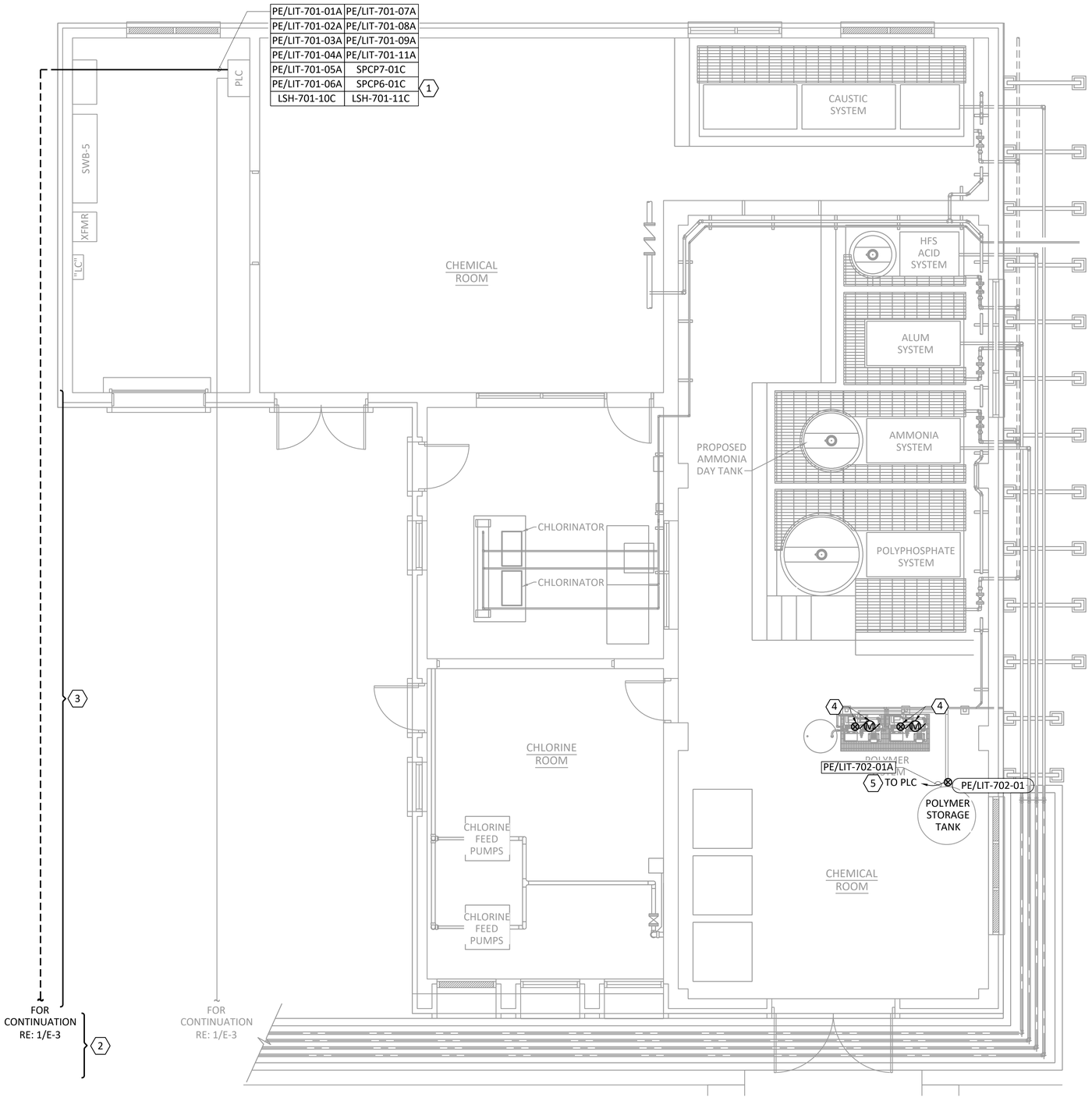

1 - CHEMICAL FEED BUILDING PROPOSED PLAN

1/4" = 1'-0"

GENERAL NOTES:

1. POWER, DISCRETE, AND ANALOG CONDUCTORS SHALL BE ROUTED IN SEPARATE CONDUITS.

NOTES BY SYMBOL "⬡"

1. ROUTE ANALOG AND DISCRETE CONDUCTORS IN SEPARATE CONDUIT.
2. CONTRACTOR SHALL TRENCH UNDER THE CHEMICAL PIPE CHASE.
3. CONTRACTOR SHALL CUT CONCRETE AND REPAIR.
4. REFER TO CB-M-2 FOR DEMOLITION AND CB-M-4 FOR PROPOSED PUMP AND FLOW METER. PROVIDE POWER AND CONTROLS FROM CORRESPONDING POLYMER PANEL ONCE DEMOLITION OF EXISTING PUMP AND FLOW SWITCH IS FINISHED.
5. PLC LOCATED IN CHEMICAL FEED BUILDING. RE: 1/E-6.

NORTH

0 1' 2' 4' 8'

1/4"=1'-0"

ISSUED FOR BID

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

JOHN W.P. MANNING 95784 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS
02/01/22

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
ELECTRICAL
CHEMICAL FEED BUILDING PROPOSED PLAN

F&N JOB NO.	BMT21704
DATE	01/28/2022
DESIGNED	HW
DRAWN	HW
REVISED	-
CHECKED	JWM
FILE NAME	EL-CFB-PL-PROP_FI.dwg

NO. | ISSUE | BY | DATE

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SHEET E-6

SEQ. .

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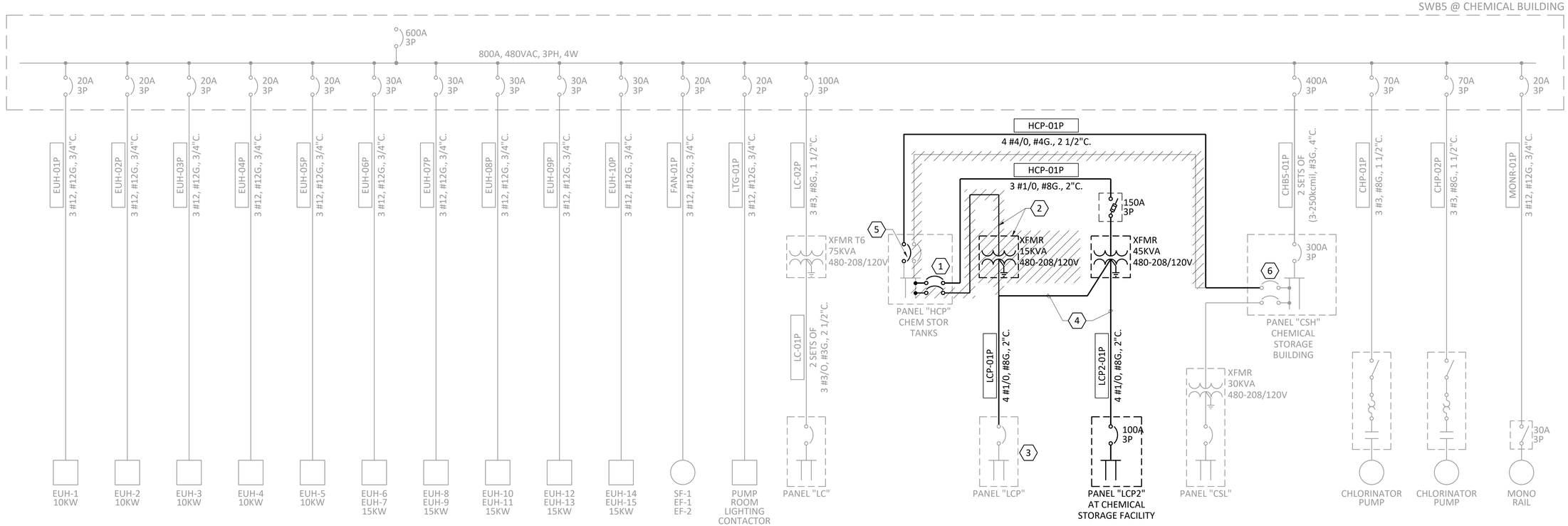
Plot Date: 2/1/2022 3:32 PM Plot By: 02789 Filename: N:\ELEC\#1 - FLOOD IMPROVEMENTS\EL-CFB-PL-PROP_FI.dwg

GENERAL NOTES:

1. EXISTING EQUIPMENT, BREAKERS, FEEDERS, ETC IS SHOWN WITH LIGHT LINES.
2. NEW WORK IS INDICATED BY DARK LINES.
3. CIRCUIT BREAKERS INSTALLED UNDER THIS CONTRACT SHALL BE NEW, NOT REFURBISHED UNITS, FROM AUTHORIZED DISTRIBUTOR.
4. PROVIDE NEW TYPED PANELBOARD/SWITCHBOARD DIRECTORY TO REFLECT CIRCUIT MODIFICATIONS.
5. SEE PANELBOARD SCHEDULES ON SHEET E-7 FOR ADDITIONAL CIRCUITS.

NOTES BY SYMBOL "⬡"

1. PROVIDE NEW 3P/150A CIRCUIT BREAKER FOR 45 KVA TRANSFORMER. REMOVE 3P/60A CIRCUIT BREAKER FEEDING 15KVA TRANSFORMER. THE A.I.C. RATING OF THE CIRCUIT BREAKER WILL MATCH THE FULL A.I.C. RATING OF THE PANEL. FIELD VERIFY ALL REQUIREMENTS.
2. REMOVE 15KVA TRANSFORMER AND ASSOCIATED PRIMARY AND SECONDARY FEEDER.
3. PANELBOARD "LCP" AND ASSOCIATED CIRCUITRY TO REMAIN.
4. TOTAL FEEDER LENGTH SHALL NOT EXCEED 10'-0".
5. PROVIDE NEW 3P/200A MAIN CIRCUIT BREAKER. DEMOLISH EXISTING 3P/150A MAIN CIRCUIT BREAKER FOR PANEL HCP AND ALL EXISTING CONDUCTORS FEEDING PANEL HCP FROM SWB5 IN THE CHEMICAL BUILDING. THE A.I.C. RATING OF THE CIRCUIT BREAKER WILL MATCH THE FULL A.I.C. RATING OF THE PANEL. FIELD VERIFY ALL REQUIREMENTS.
6. CONTRACTOR TO FIELD VERIFY EXISTING CIRCUIT BREAKER IN SWB5 FOR PANEL HCP IS AT LEAST 200A/3P. IF LESS THAN 200A CIRCUIT BREAKER, DEMOLISH AND REPLACE WITH 200A/3P CIRCUIT BREAKER. THE A.I.C. RATING OF THE CIRCUIT BREAKER WILL MATCH THE FULL A.I.C. RATING OF THE PANEL. FIELD VERIFY ALL REQUIREMENTS.



1 / - ONE-LINE DIAGRAM

NOT TO SCALE

ISSUED FOR BID

Freese and Nichols, Inc
Texas Registered Engineering Firm F-2144

STATE OF TEXAS
JOHN W.P. MANNING
93784
LICENSED PROFESSIONAL ENGINEER
02/01/22

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
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CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
ELECTRICAL

ONE-LINE DIAGRAM

NO.	ISSUE	BY	DATE

F&N JOB NO. BMT21704
DATE 01/28/2022
DESIGNED HW
DRAWN HW
REVISED -
CHECKED JWM
FILE NAME EL-ALL-DG-ONEL01_FI.dwg

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1"

SHEET E-7
SEQ. 29

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Plot Date: 2/1/2022 1:56 PM Plot By: 02789 Filename: N:\ELEC\#1 - FLOOD IMPROVEMENTS\EL-ALL-DG-ONEL01_FI.dwg

INTERCONNECTION DIAGRAM

LOOP	EQUIPMENT DESCRIPTION	FIELD DEVICE/FIELD WIRING	
701	EXISTING CS-T1 ALUM TANK LEVEL TRANSMITTER	PE/LIT-701-01	PE/LIT-701-01A — 1 PR. #18 SHLD., 2"C.
701	EXISTING CS-T2 ALUM TANK LEVEL TRANSMITTER	PE/LIT-701-02	PE/LIT-701-02A — 1 PR. #18 SHLD., 2"C.
701	EXISTING CS-T3 ALUM TANK LEVEL TRANSMITTER	PE/LIT-701-03	PE/LIT-701-03A — 1 PR. #18 SHLD., 2"C.
701	EXISTING CS-T4 ALUM TANK LEVEL TRANSMITTER	PE/LIT-701-04	PE/LIT-701-04A — 1 PR. #18 SHLD., 2"C.
701	CS-T5 ALUM TANK PRESSURE TRANSMITTER	PE/LIT-701-05	PE/LIT-701-05A — 1PR. #18 SHLD., 2"C.
701	EXISTING CS-T6 FLUORIDE TANK LEVEL	PE/LIT-701-06	PE/LIT-701-06A — 1 PR. #18 SHLD., 2"C.
701	EXISTING CS-T7 AMMONIA TANK LEVEL	PE/LIT-701-07	PE/LIT-701-07A — 1 PR. #18 SHLD., 2"C.
701	CS-T8 CAUSTIC TANK PRESSURE TRANSMITTER	PE/LIT-701-08	PE/LIT-701-08A — 1PR. #18 SHLD., 2"C.
701	CS-T9 CAUSTIC TANK PRESSURE TRANSMITTER	PE/LIT-701-09	PE/LIT-701-09A — 1PR. #18 SHLD., 2"C.
701	CS-T11 CAUSTIC TANK PRESSURE TRANSMITTER	PE/LIT-701-11	PE/LIT-701-11A — 1PR. #18 SHLD., 2"C.
702	POLYMER TANK LEVEL	PE/LIT-702-01	PE/LIT-702-01A — 1PR. #18 SHLD., 1"C.
703	CAUSTIC CONTAINMENT HIGH LEVEL FLOAT	LSH-703-11	LSH-703-11C — 2 #14, #14G., 2"C.
703	ALUM CONTAINMENT HIGH LEVEL FLOAT	LSH-703-10	LSH-703-10C — 2 #14, #14G., 2"C.
705	SUMP PUMP CONTROL PANEL "SPCP-7"	SPCP-7	SPCP7-01C — 2 #14, #14G., 2"C.
705	SUMP PUMP CONTROL PANEL "SPCP-6"	SPCP-6	SPCP6-01C — 2 #14, #14G., 2"C.

EXISTING PLC IN CHEMICAL FEED BUILDING

NOTES BY SYMBOL "⬡"

1. CONTRACTOR TO FIELD VERIFY AND MATCH A.I.C. RATING OF EQUIPMENT AHEAD OF PANEL "LCP2".
2. PROPOSED CIRCUIT BREAKERS.
3. PROVIDE 30mA GFI CIRCUIT BREAKER.
4. DEMOLISH EXISTING M.C.B. AND REPLACE WITH 200A M.C.B.

PANEL NO. LCP2 — MAIN 100 AMPS M.C.B. — LOCATION CHEMICAL TANK FARM
SERVICE VOLTAGE 208Y/120 VOLTS — BUS RATING 125 AMPS
A.I.C. 42,000 — NEUTRAL BUS 125 AMPS — FEED FROM PANEL "HCP" VIA XFMR

DESCRIPTION	BREAKER POLE	BREAKER AMP	VOLT AMPS A	VOLT AMPS B	VOLT AMPS C	CKT NO	BUSS CONN	CKT NO	VOLT AMPS A	VOLT AMPS B	VOLT AMPS C	BREAKER POLE	BREAKER AMP	DESCRIPTION
SUMP PUMP CONTROL PANEL SPCP-6	1	20	1000			1		2	1000			1	20	SUMP PUMP CONTROL PANEL SPCP-7
⬡3 * CS-T8 TANK HEATER	1	30		2880		3		4		2880		1	30	* CS-T9 TANK HEATER ⬡3
⬡3 * CS-T11 TANK HEATER	1	30			2880	5		6			500	1	20	CAUSTIC TANK HEAT TRACE ⬡3
⬡3 CAUSTIC HEAT TRACE	1	20	500			7		8	-			1	30	SPARE
SPARE	1	20		-		9		10		-		1	20	SPARE
SPARE	1	20			-	11		12			-	1	20	SPARE
SPARE	1	20	-			13		14	-			1	20	SPARE
SPARE	1	20		-		15		16		-		1	20	SPARE
SPARE	1	20			-	17		18			-	1	20	SPARE
			1500	2880	2880				1000	2880	500			

CONNECTED BUS A 2,500 VA — CONNECTED BUS B 5,760 VA — CONNECTED BUS C 3,380 VA
TOTAL: 11640 VA
DEMAND KVA: 11.6 — DEMAND AMPS: 32.3
NOTE: * INDICATES GFI BREAKER

PANEL NO. HCP (EXISTING) — MAIN ⬡4 200 AMPS M.C.B. — LOCATION CHEMICAL TANK FARM
SERVICE VOLTAGE 480Y/277 VOLTS — BUS RATING 200 AMPS
A.I.C. 14,000 ⬡1 — NEUTRAL BUS 200 AMPS — FEED FROM PANEL "CSH"

DESCRIPTION	BREAKER POLE	BREAKER AMP	VOLT AMPS A	VOLT AMPS B	VOLT AMPS C	CKT NO	BUSS CONN	CKT NO	VOLT AMPS A	VOLT AMPS B	VOLT AMPS C	BREAKER POLE	BREAKER AMP	DESCRIPTION
SPACE						1		2						SPACE
SPACE						3		4						SPACE
SPACE						5		6						SPACE
⬡2 XFMR 45KVA	3		15000			7		8	1000			1	20	EXISTING LIGHTS
				15000		9		10		1000		1	20	EXISTING LIGHTS
		100			15000	11		12			1000	1	20	EXISTING CB
EXISTING CB	1	20	1000			13		14	1000			1	20	EXISTING CB
EXISTING CB	1	20		1000		15		16		1000		1	20	EXISTING CB
EXISTING CB	1	20			1000	17		18			1000	1	20	EXISTING CB
			16000	16000	16000				2000	2000	2000			

CONNECTED BUS A 18,000 VA — CONNECTED BUS B 18,000 VA — CONNECTED BUS C 18,000 VA
TOTAL: 54000 VA
DEMAND KVA: 54.0 — DEMAND AMPS: 149.9
NOTE: ** INDICATES ITEMS UNDER THIS CONTRACT
NOTE: * INDICATES GFI BREAKER

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

JOHN W.P. MANNING 93784 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS 02/01/22

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
ELECTRICAL
INTERCONNECTION DIAGRAM

NO.	ISSUE	BY	DATE

F&N JOB NO. BMT21704
DATE 01/28/2022
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REVISED -
CHECKED JWM
FILE NAME EL-ALL-DG-INTR01_FI.dwg

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SHEET E-8
SEQ. 30

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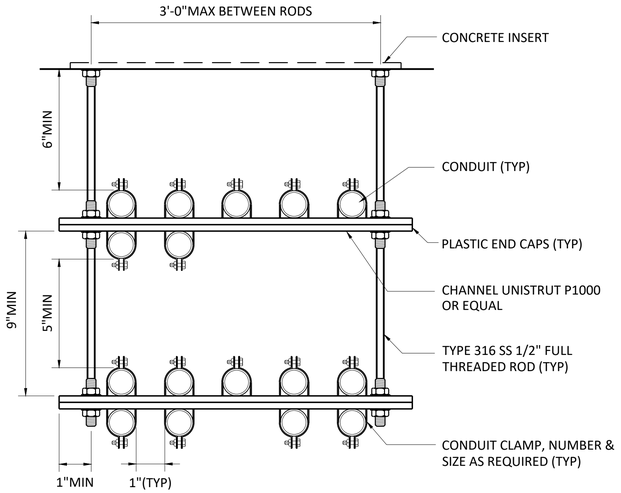
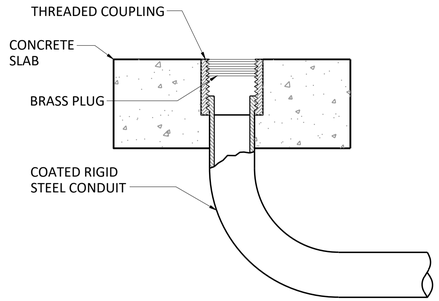


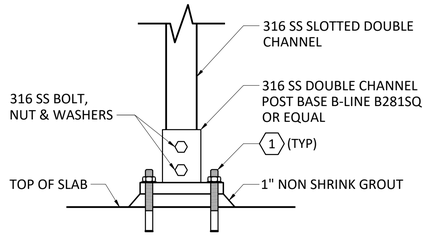
1 - CEILING MOUNTED CONDUIT RACK

NOT TO SCALE



2 - CONDUIT STUB-UP

NOT TO SCALE

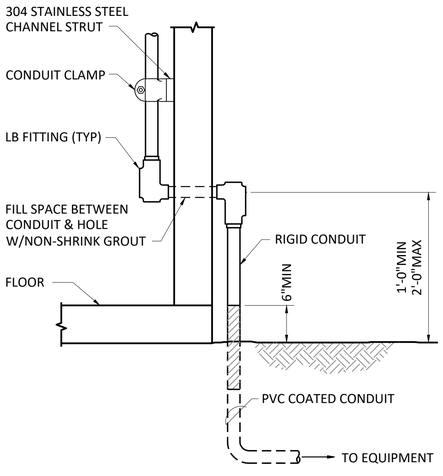


NO.3 NOTES BY SYMBOL "⬡"

1. 3/4"DIA 316 STAINLESS STEEL EXPOXY ANCHOR (TYP OF 4).

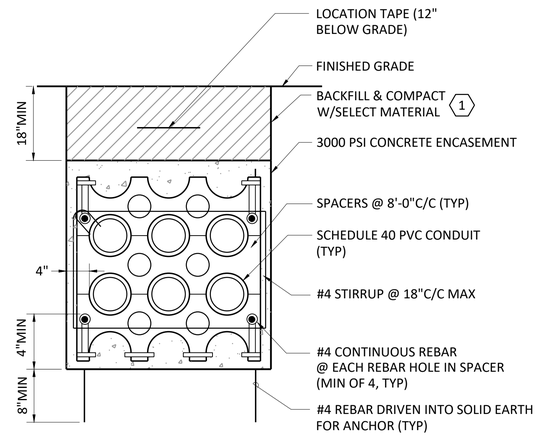
3 - FREE STANDING SUPPORT DETAIL

NOT TO SCALE



4 - WALL PENETRATION

NOT TO SCALE



NO.5 GENERAL NOTES:

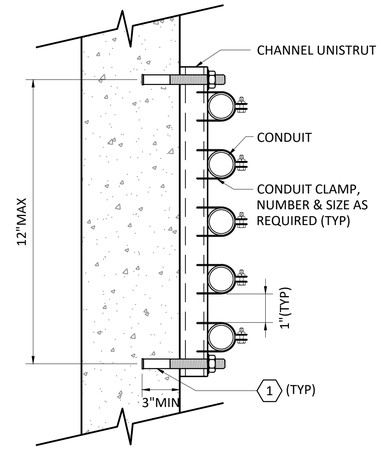
1. CONTRACTOR SHALL PROVIDE CHAIRS FOR REBAR ROUTED ALONG BOTTOM OF DUCT BANK TO VERIFY THAT REBAR IS FULLY ENCASED WITH 4" OF CONCRETE.

NO.5 NOTES BY SYMBOL "⬡"

1. SELECT BACKFILL TO BE CLASS 4 EARTH FILL. FILL SHALL CONSIST OF MATERIALS WHICH ARE CLASSIFIED AS SP, SM, SC, CL OR DUAL CLASSIFICATIONS THEREOF, WHICH HAVE A LIQUID LIMIT LESS THAN OR EQUAL TO 35 AND A PLASTICITY INDEX OF A MINIMUM OF 4 AND A MAXIMUM OF 15, WHICH ARE FREE OF ORGANIC MATERIALS.

5 - CONCRETE ENCASED DUCT BANK DETAIL

NOT TO SCALE



NO.6 NOTES BY SYMBOL "⬡"

1. ANCHORS.

6 - WALL MOUNTED CONDUIT RACK

NOT TO SCALE

ISSUED FOR BID

Freese and Nichols, Inc
Texas Registered Engineering Firm F-2144

STATE OF TEXAS
JOHN W.P. MANNING
93784
LICENSED
PROFESSIONAL ENGINEER
02/01/22

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CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS

ELECTRICAL

DETAILS I

F&N JOB NO.	BMT21704
DATE	01/28/2022
DESIGNED	HW
DRAWN	HW
REVISED	-
CHECKED	JWM
FILE NAME	EL-ALL-DT-MISC01_FI.dwg

NO.	ISSUE	BY	DATE
1			

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VERIFY SCALE 0 1

SHEET E-9

SEQ. 31

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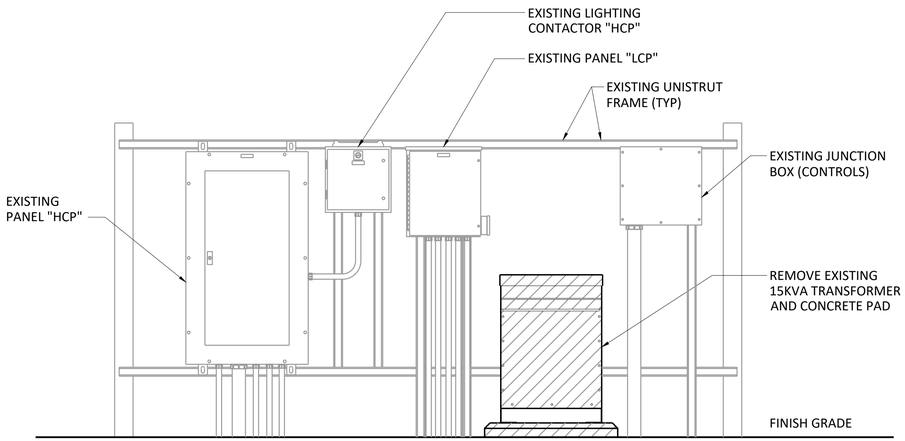
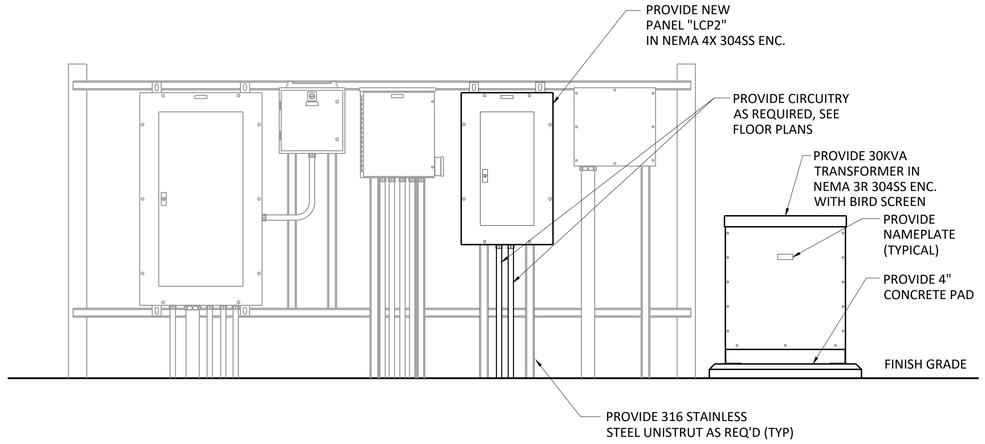


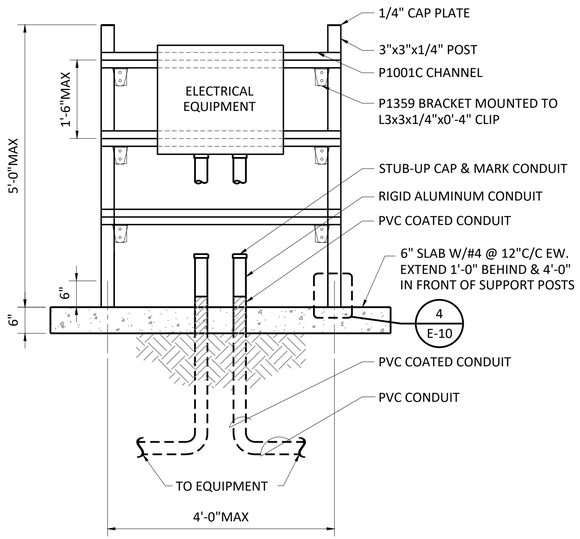
1 - ELEVATION AT TANK FARM - DEMOLITION

NOT TO SCALE



2 - ELEVATION AT TANK FARM - NEW

NOT TO SCALE

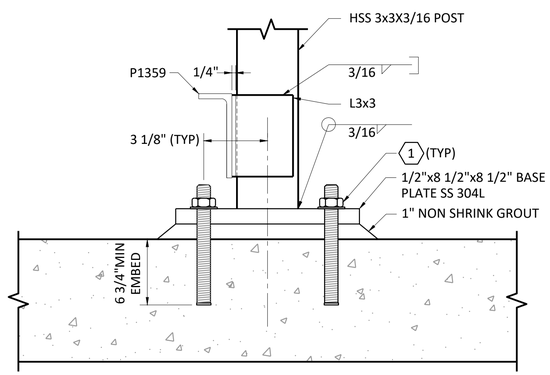


NO.3 GENERAL NOTES:

1. ALL MEMBERS SHOWN AND REQUIRED CONNECTING HARDWARE SHALL BE STAINLESS STEEL.
2. MEMBERS ARE INDICATED BY UNISTRUT PART NUMBERS. PROVIDE ALL MEMBERS AND CONNECTING HARDWARE BY UNISTRUT OR APPROVED EQUAL.
3. SLOPE SLAB-ON-GRADE TO DRAIN.
4. RACKS SHALL BE GROUNDED PER THE NATIONAL ELECTRICAL CODE. PROVIDE AS A MINIMUM ONE (1) 3/4"x10'-0" COPPER CLAD GROUND ROD ON EACH SIDE OF THE ELECTRICAL EQUIPMENT RACK.
5. ALL NUTS, BOLTS, WASHERS, OTHER FASTENERS AND HARDWARE ON ELECTRICAL EQUIPMENT RACK SHALL BE STAINLESS STEEL.
6. PROVIDE TWO (2) 9/16"DIA BOLT HOLES IN OUTSTANDING LEG OF L3x3 CLIP ANGLE OF ATTACHMENT OF UNISTRUT P1359 BRACKET.

3 - ELECTRICAL EQUIPMENT RACK DETAIL

NOT TO SCALE

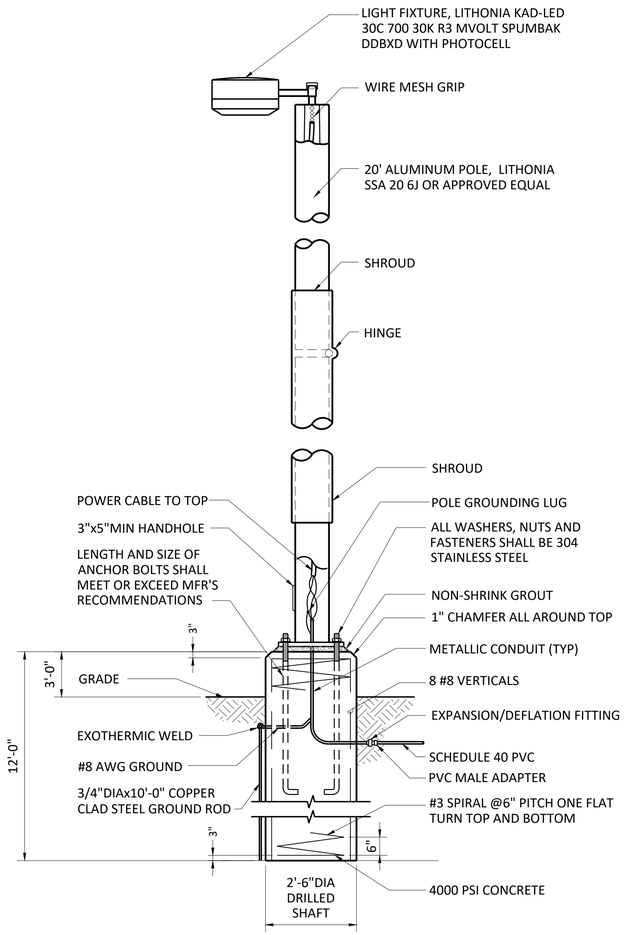


NO.4 NOTES BY SYMBOL "⬡"

1. 3/4"DIA 304L STAINLESS STEEL EPOXY ANCHOR (TYP OF 4). DO NOT DAMAGE STRUCTURE DURING ANCHOR INSTALLMENT.

4 - EQUIPMENT RACK SUPPORT DETAIL

NOT TO SCALE



5 - HINGED POLE & BASE

NOT TO SCALE

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Freese and Nichols, Inc
Texas Registered Engineering Firm F-2144

STATE OF TEXAS — JOHN W.P. MANNING — 95784 — LICENSED PROFESSIONAL ENGINEER — 02/01/22

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
ELECTRICAL
DETAILS II

NO.	ISSUE	BY	DATE

F&N JOB NO. BMT21704
DATE 01/28/2022
DESIGNED HW
DRAWN HW
REVISED -
CHECKED JWM
FILE NAME EL-ALL-DT-MISC02_FI.dwg

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SHEET E-10

SEQ. 32

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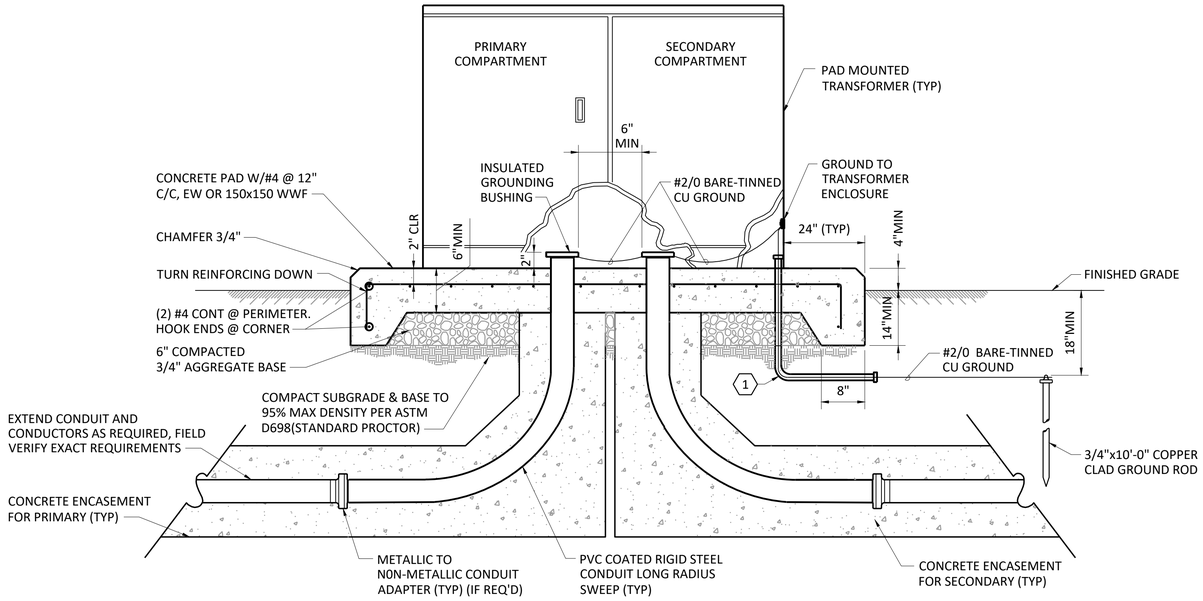


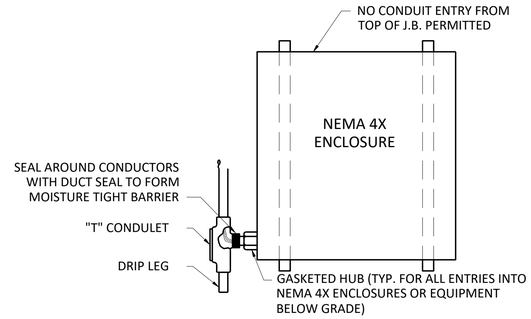
NO.1 GENERAL NOTES:

1. COORDINATE LOCATIONS OF CONDUIT PENETRATIONS WITH TRANSFORMER SUPPLIER.

NO.1 NOTES BY SYMBOL "⬡"

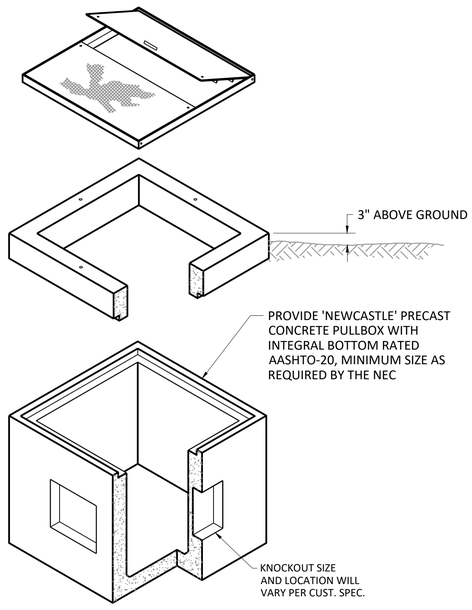
1. PROVIDE A 1" PVC CONDUIT SLEEVE FOR GROUND CONDUCTOR, INCLUDING ELBOW AND EXTEND PAST PAD.

1 - TRANSFORMER DETAIL (TYP)
NOT TO SCALE

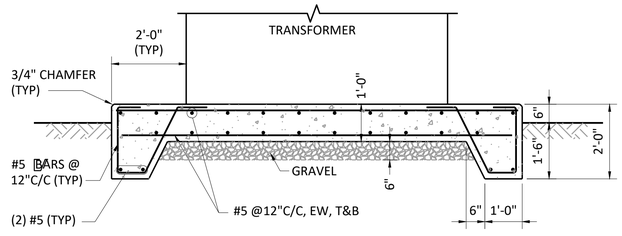


(TYPICAL CONDUIT DRAIN FOR ALL EQUIP. BELOW GRADE)

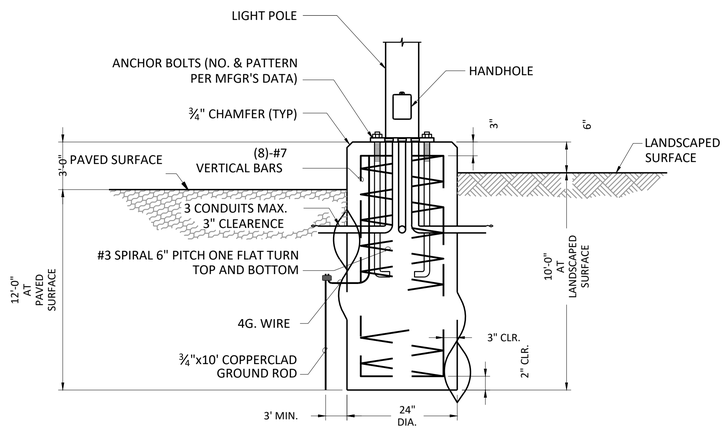
2 - TYPICAL JUNCTION BOX & CONDUIT DRAIN DETAIL
NOT TO SCALE



3 - PULL BOX DETAIL
NOT TO SCALE



4 - TRANSFORMER PAD
NOT TO SCALE



NO.5 GENERAL NOTES:
ALL BOLTS, WASHERS, NUTS AND OTHER FASTENERS ARE STAINLESS STEEL.

5 - LIGHT POLE BASE
NOT TO SCALE

ISSUED FOR BID

Freese and Nichols, Inc
Texas Registered Engineering Firm F-2144

STATE OF TEXAS
JOHN W.P. MANNING
93784
LICENSED
PROFESSIONAL ENGINEER
02/01/22

FREESE NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
ELECTRICAL
DETAILS III

NO.	ISSUE	BY	DATE

F&N JOB NO. BMT21704
DATE 01/28/2022
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Plot Date: 2/1/2022 1:59 PM Plot By: 02789 Filename: N:\ELEC\EL-ALL-DT-MISC03_FI.dwg

PIPE PENETRATION NOTES

1. WHERE PIPES PASS THROUGH WALL, FLOOR OR CEILINGS, PENETRATIONS SHALL CONFORM TO TABLE EXCEPT AS OTHERWISE NOTED.
2. IN TABLE, "STRUCTURE" SHALL MEAN ROOM, GALLERY, OR ANY SIMILAR ENCLOSURE.
3. IN TABLE, "TANK" SHALL MEAN ANY PART OF A STRUCTURE CONTAINING LIQUID OR IN CONTACT WITH THE EARTH.
4. IN TABLE WATER SURFACE "WS" SHALL MEAN AN ELEVATION 9" ABOVE MAXIMUM WATER SURFACE SHOWN.
5. ALL STEEL SLEEVES SHALL BE STAINLESS STEEL, UNLESS OTHERWISE NOTED.
6. IN CONDITION 5, TYPES D,E,H AND I SHALL BE USED WHERE ONE SIDE CONTAINS EXPLOSION PROOF EQUIPMENT, WHERE FLOODING IS POSSIBLE OR WHERE SPECIFIED.
7. SEAL FLANGES SHALL BE DRILLED TO 150 POUND STANDARD. EACH JOINT SHALL HAVE GASKETS.
8. PROVIDE CURB WHERE PENETRATING FLOOR, EXCEPT FOR PENETRATION TYPES A AND C.
9. FLEXIBLE JOINTS SHALL BE PROVIDED FOR UNDERGROUND PIPING.
10. RESTRAINED FLEXIBLE COUPLINGS FOR STEEL PIPE SHALL BE DESIGNED FOR 100 PSI LINE PRESSURE UNLESS OTHERWISE SPECIFIED IN ACCORDANCE WITH AWWA MANUAL M11. FIGURES 13-18 AND TABLE 13-4 SHALL BE USED.
11. INSULATION SHALL NOT EXTEND THROUGH SLEEVES, UNLESS OTHERWISE NOTED.
12. WHERE DUCTILE IRON PIPE IS EMBEDDED IN CONCRETE AT AN EXPANSION JOINT USE TYPE J.
13. WEEP RINGS SHALL HAVE A MINIMUM DIAMETER EQUAL TO THE PIPE DIAMETER PLUS 6-INCHES.
14. TANK SIDE OF WALL SHALL MEAN SIDE OF WALL NORMALLY EXPOSED TO LIQUID, EARTH, OR OUTSIDE ATMOSPHERE.
15. SEAL WITH MASTIC SEALANT WHERE WALL IS EXPOSED TO LIQUID, EARTH, OR EXPLOSION HAZARD AREA.
16. NOT ALL PIPE PENETRATIONS MAY BE USED IN THESE PLANS.
17. OD = OUTSIDE DIAMETER
18. SEE PRESTRESSED CONCRETE PIPE AND TRENCH DETAILS FOR BLOCKING, FLANGED CONNECTIONS AND TEMPORARY TEST PLUGS.
19. WHERE PIPE COVER IS 10 FEET OR MORE, THIS DIMENSION SHALL BE 0.85xD.

TABLE A - PIPE SPAN AND SUPPORT ROD SIZE

NOMINAL PIPE SIZE (INCHES)	SUPPORT ROD SIZE AND MAXIMUM LOAD PER ROD SEE NOTES A1-A5				MAXIMUM PIPE SPAN (FEET)			
	ONE ROD SUPPORT SYSTEM		TWO ROD SUPPORT SYSTEM					
	ROD SIZE (INCHES)	MAX LOAD (POUNDS)	ROD SIZE (INCHES)	MAX LOAD (POUNDS)	STEEL	COPPER	PLASTIC SEE NOTE A3	DUCTILE IRON SEE NOTE A5
3/8" TO 3/4"	3/8"	610	3/8"	610	5	5	CONTINUOUS	——
1	3/8"	610	3/8"	610	5	5	5	——
1 1/4	3/8"	610	3/8"	610	5	5	5	——
1 1/2	3/8"	610	3/8"	610	5	5	5	——
2	3/8"	610	3/8"	610	10	5	5	
2 1/2	1/2"	1130	3/8"	610	10	10	5	
3	1/2"	1130	3/8"	610	10	20	5	
4	5/8"	1810	3/8"	610	10	20	5	
6	3/4"	2710	1/2"	1130	15	20	5	
8	7/8"	3770	5/8"	1810	15	20	5	
10	1"	4960	3/4"	2710	20	——	5	
12	1 1/4"	8000	7/8"	3770	20	——	10	
14	1 1/4"	8000	1"	4960	20	——	——	
16	1 1/4"	8000	1"	4960	25	——	——	
18	1 1/4"	8000	1"	4960	25	——	——	
20	1 1/2"	11630	1 1/4"	8000	25	——	——	
24	1 1/2"	11630	1 1/2"	11630	30	——	——	
30	1 1/2"	11630	1 1/2"	11630	30	——	——	

12 FEET FOR PRESSURE PIPE

10 FEET FOR SOIL PIPE

TABLE A NOTES:

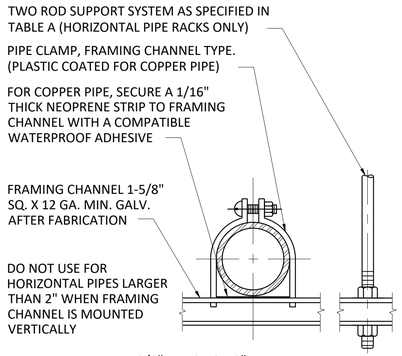
A1. DESIGN WEIGHT SHALL BE THE WEIGHT OF THE PIPE FULL OF WATER.
IF FLUID CONVEYED IS NOT WATER, DESIGN WEIGHT SHALL BE DETERMINED BY SPECIFIC GRAVITY OF FLUID AND PIPE WEIGHT. HANGER SYSTEMS SHALL BE
A2. DESIGNED FOR A FACTOR OF SAFETY OF 5 OR GREATER.

ROD SIZES SHOWN ARE FOR THE SUPPORT OF A SINGLE PIPE. WHEN SUPPORTING MORE THAN ONE PIPE, ROD SHALL BE SIZED USING THE DESIGNED WEIGHTS (SEE NOTE 1) TO DETERMINE THE TOTAL DESIGN LOAD. THE
A3. TOTAL DESIGN LOAD SHALL NOT EXCEED THE MAXIMUM LOADS SHOWN IN TABLE A.

SPAN SHOWN IS FOR SCHEDULE 80 PVC PIPE AT 100°F. SPANS FOR OTHER PLASTICS, OTHER PVC PIPE SCHEDULES AND PIPES AT HIGHER TEMPERATURES
A4. SHALL BE SHORTENED IN ACCORDANCE WITH THE PIPE MANUFACTURER'S RECOMMENDATIONS.
"CONTINUOUS" MEANS PIPE SHALL BE IN UNISTRUT POWER-STRUT OR SIMILAR CHANNEL.

FOR PIPES SUBJECT TO LONGITUDINAL MOVEMENT, OR HAVING SERVICE TEMPERATURES IN RANGES OF 33°F TO 59°F OR 120°F TO 450°F, SEE TYPICAL SUPPORT ROD FOR PIPES SUBJECT TO HORIZONTAL MOVEMENT, THIS DRAWING.

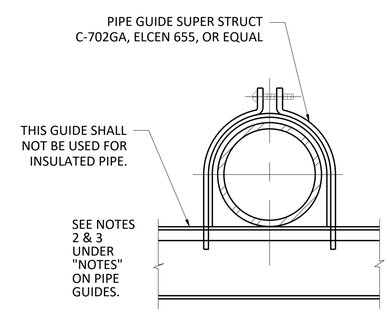
PROVIDE A MINIMUM OF ONE PIPE HANGER PER PIPE LENGTH, WITHIN 4-INCHES OF THE BELL.



3/8" THROUGH 8" PIPE

340 TYPE D — PIPE HANGER DETAIL

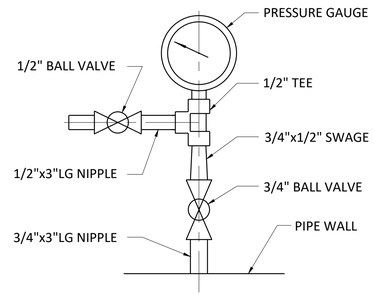
NOT TO SCALE



1/2" THROUGH 6" PIPE

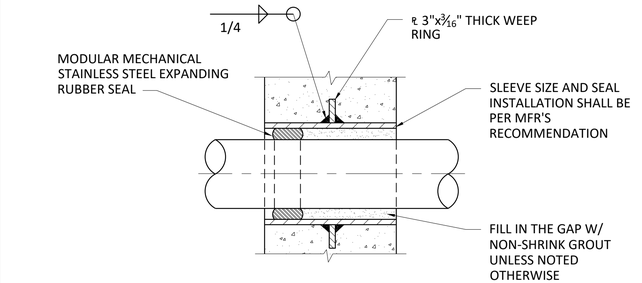
341 TYPE G1 — PIPE GUIDE DETAIL

NOT TO SCALE



358 - PRESSURE GAUGE ASSEMBLY DETAIL

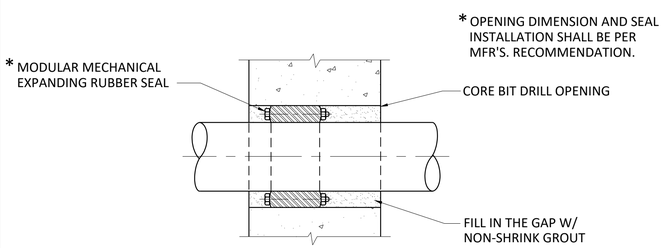
NOT TO SCALE



FOR WALLS

342 TYPE D — PIPE PENETRATION DETAIL

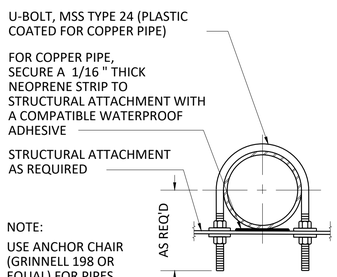
NOT TO SCALE



FOR EXISTING WALLS

342 TYPE T — PIPE PENETRATION DETAIL

NOT TO SCALE



1/2" THROUGH 24" PIPE

340 TYPE E — PIPE HANGER DETAIL

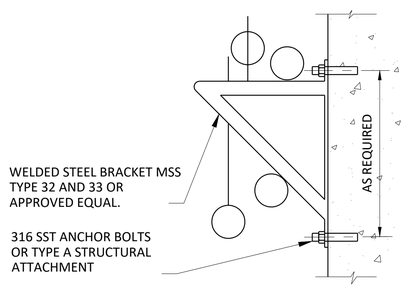
NOT TO SCALE

BRACKET MAY BE USED WITH VARIOUS HANGER, ROLLER, GUIDE, U-CLAMP AND ANCHOR ASSEMBLIES

CAPACITY 3/8" THROUGH 12" PIPE
MAXIMUM ALLOWABLE LOAD

MSS TYPE	LOAD
32	1500 LBS
33	3000 LBS

USE DESIGN WEIGHTS SHOWN IN TABLE A, TO DETERMINE TOTAL LOAD



341 TYPE E — STRUCTURAL ATTACHMENT DETAIL

NOT TO SCALE

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Freese and Nichols, Inc.
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02-01-2022

STATE OF TEXAS — 118309 — LICENSED PROFESSIONAL ENGINEER — FINAL

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11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
STANDARD DETAILS

STANDARD DETAILS I

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R&N JOB NO.	BMT21704
DATE	01/28/2022
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SHEET SD-1

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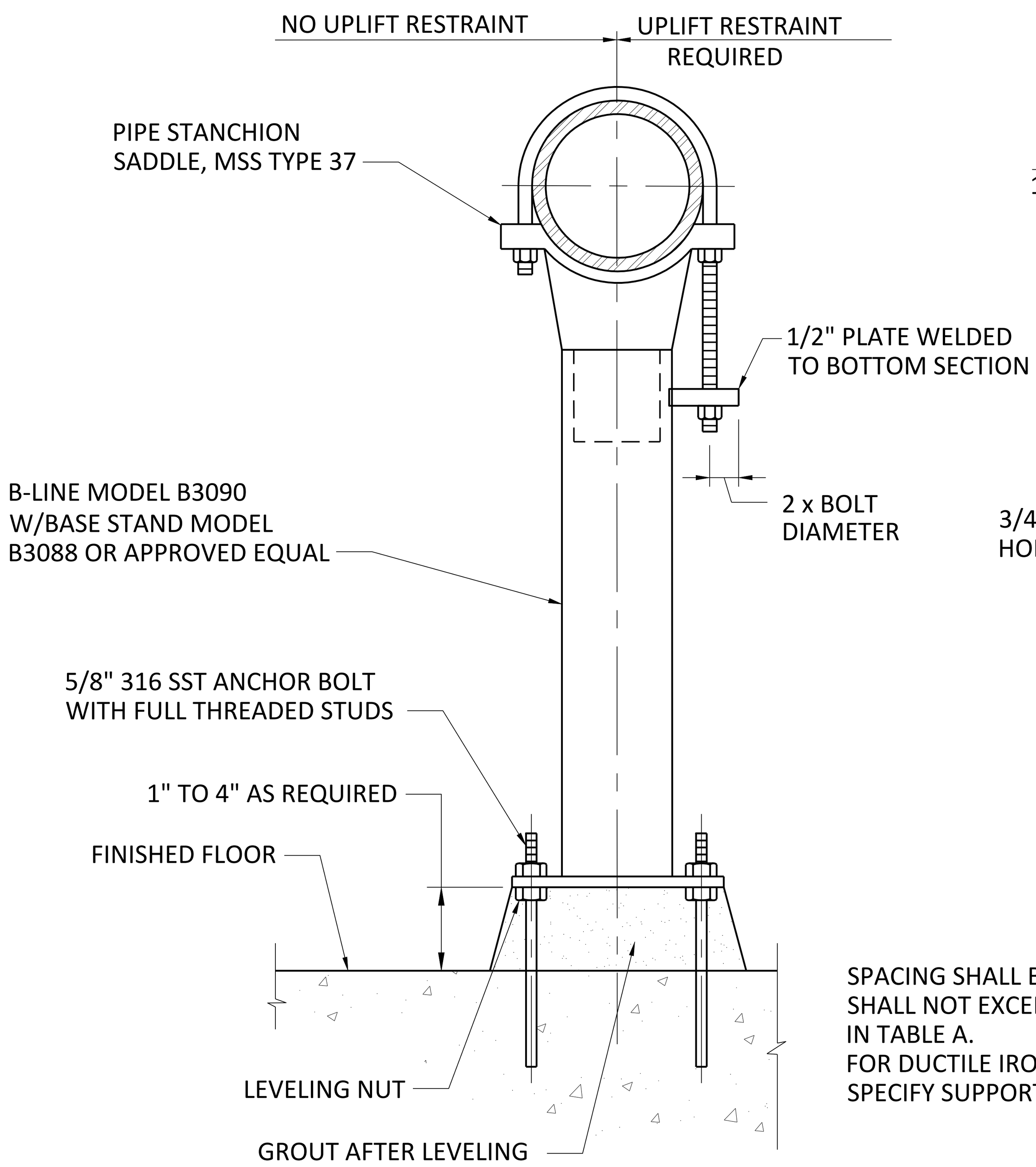
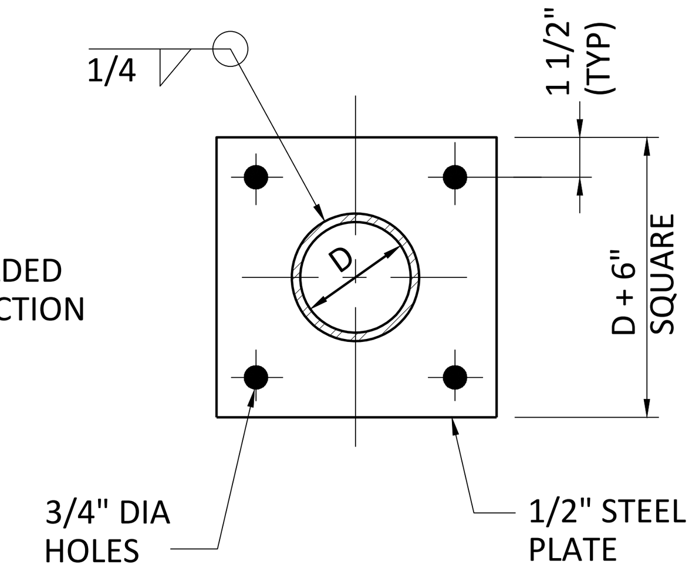
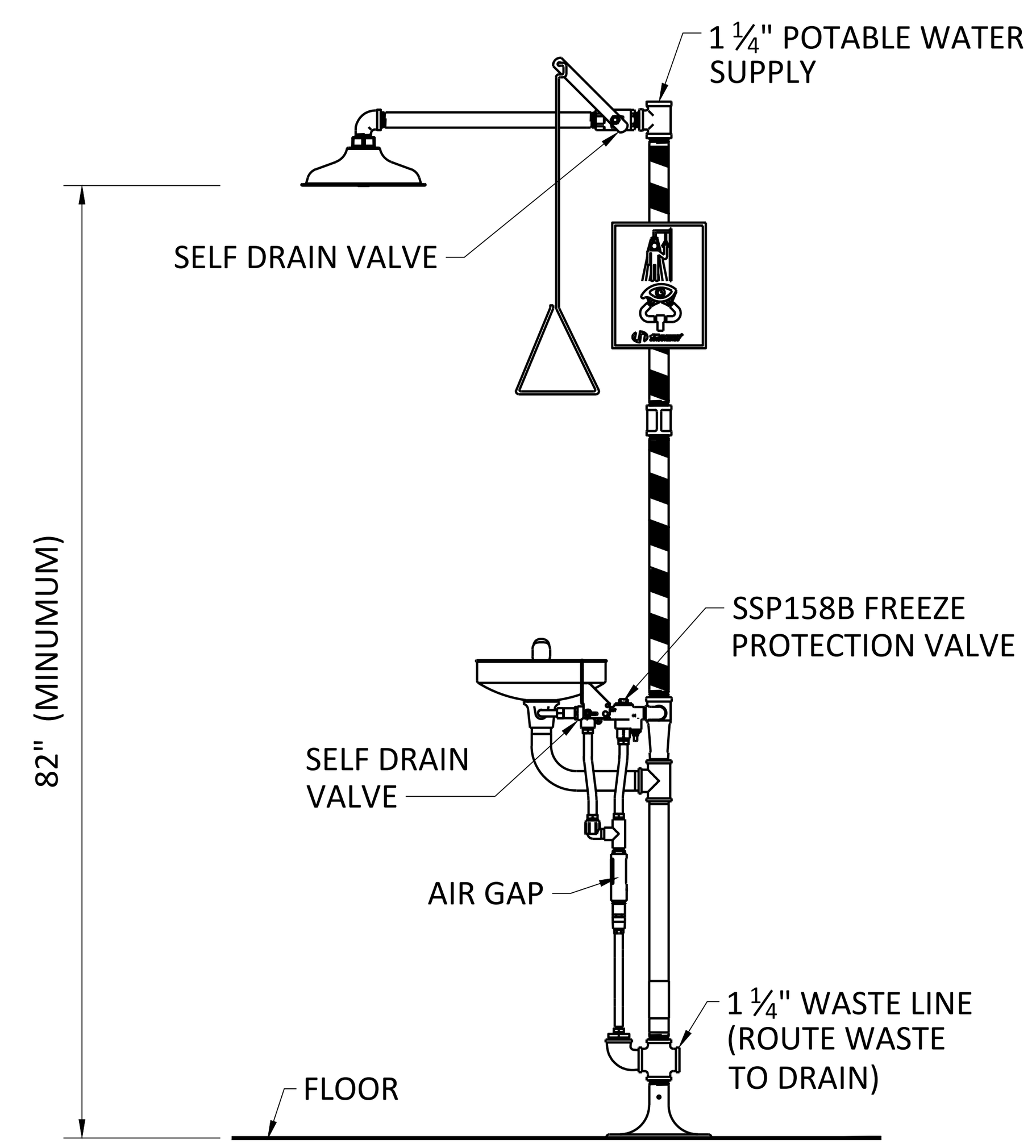




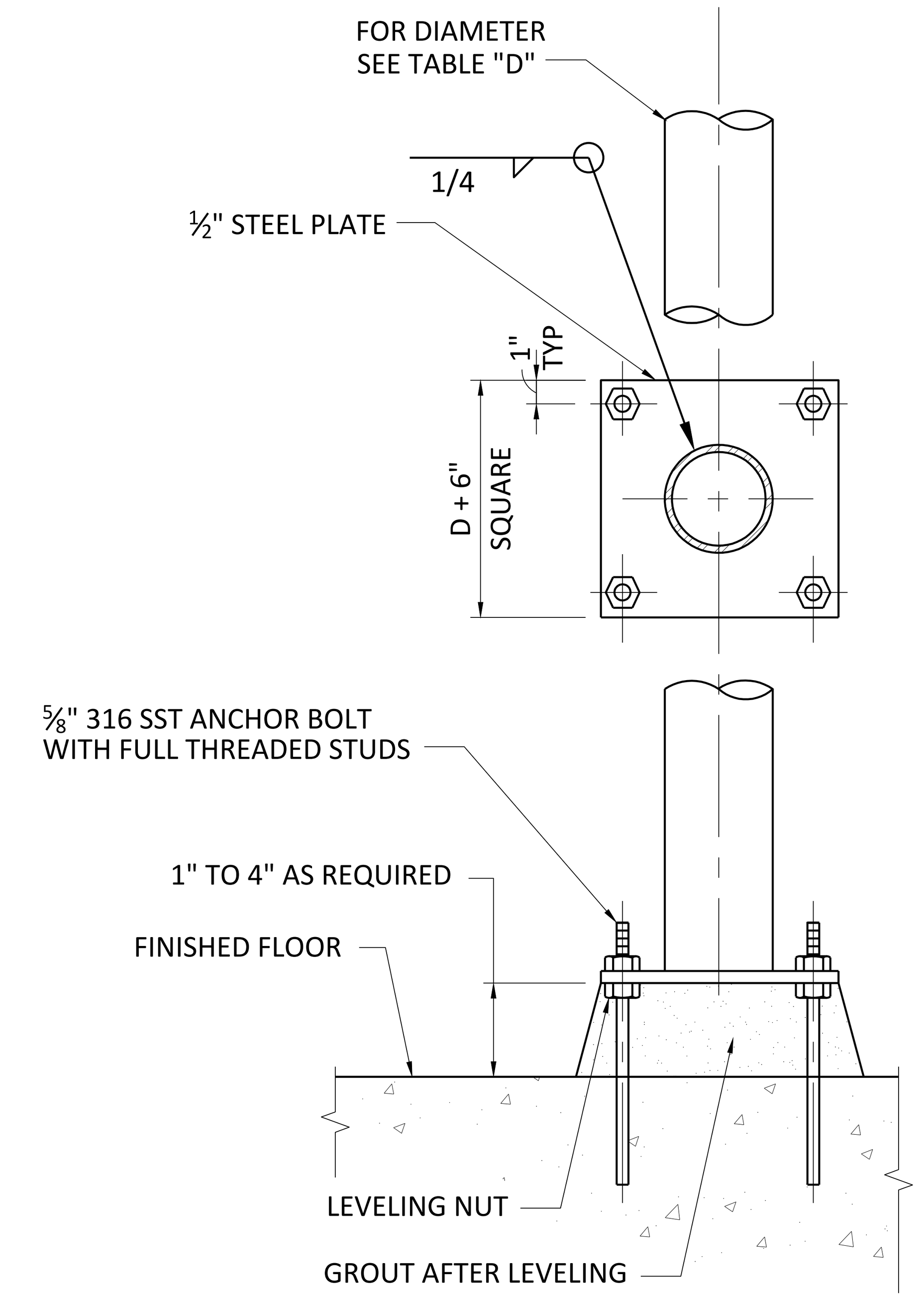
BASE PLATE DETAIL

SPACING SHALL BE AS REQUIRED, BUT SHALL NOT EXCEED THOSE SPANS SHOWN IN TABLE A.
FOR DUCTILE IRON PIPE SIZES OVER 12" SPECIFY SUPPORT FOR DUCTILE IRON.

2" THROUGH 36" PIPE
340 TYPE G — PIPE SUPPORT DETAIL
NOT TO SCALE

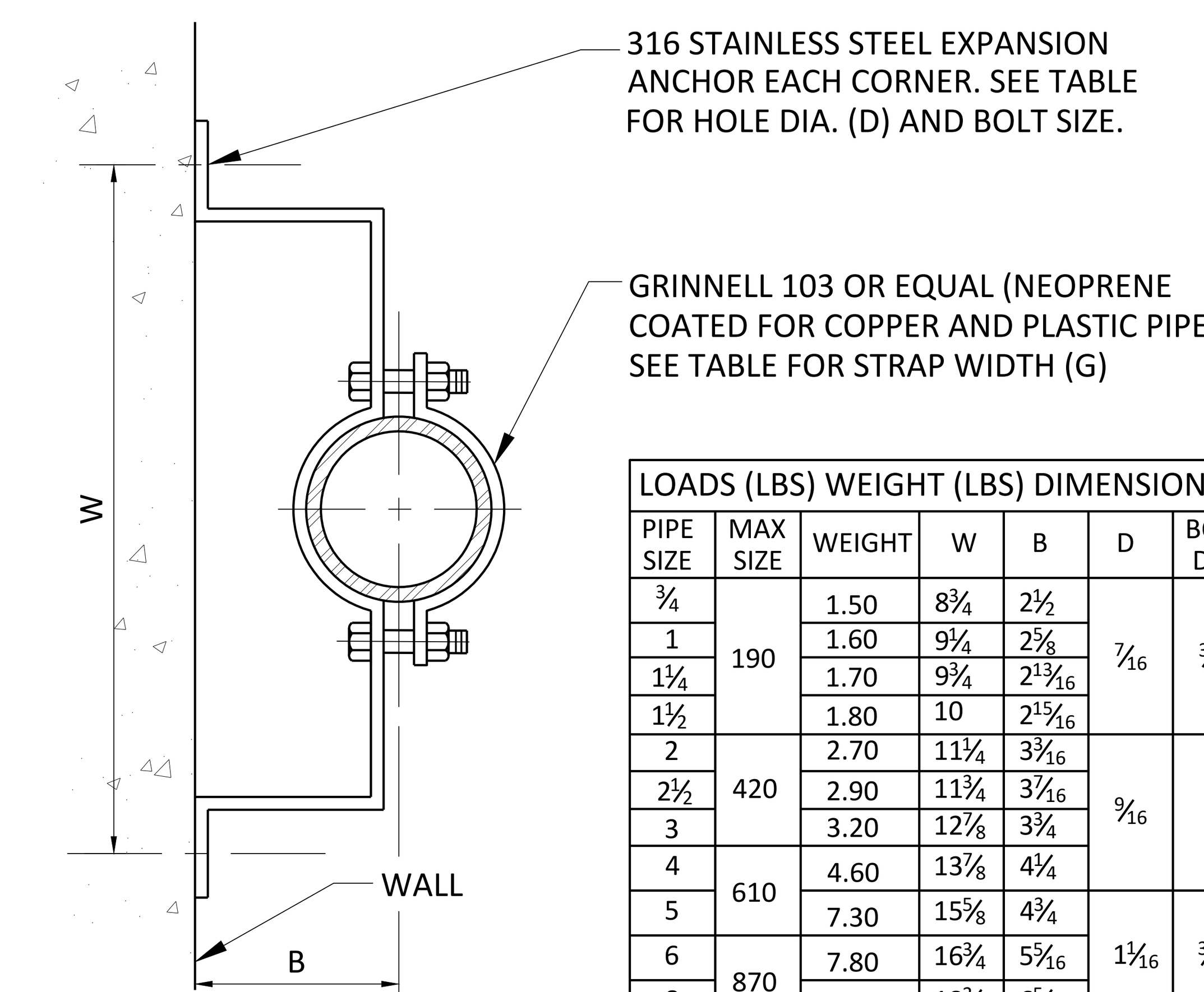


1 - — EYE WASH DETAIL
NOT TO SCALE



SPACING SHALL BE AS REQUIRED, BUT SHALL NOT EXCEED THOSE SPANS SHOWN IN TABLE A.

341 TYPE N — STRUCTURAL ATTACHMENT DETAIL
NOT TO SCALE

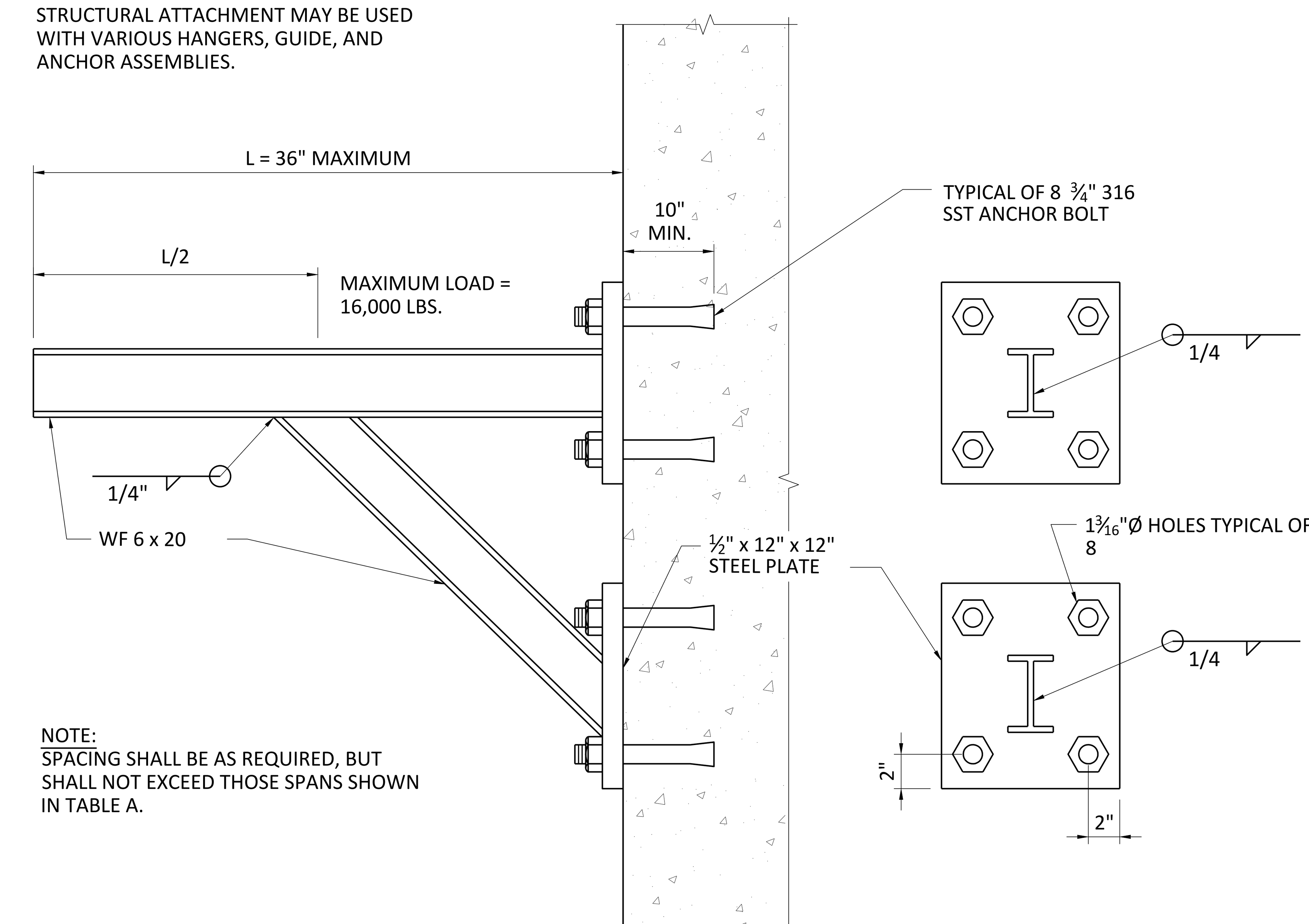


LOADS (LBS) WEIGHT (LBS) DIMENSIONS (IN)

PIPE SIZE	MAX SIZE	WEIGHT	W	B	D	BOLT DIA.	G WIDTH
¾	190	1.50	8¾	2½	7⁄16	⅜	1¼
1		1.60	9¼	2⅝			
1¼		1.70	9¾	2 13⁄16			
1½		1.80	10	2 15⁄16			
2	420	2.70	11¼	3 3⁄16	9⁄16	½	
2½		2.90	11¾	3 7⁄16			
3		3.20	12⅞	3¾			
4	610	4.60	13⅞	4¼			1½
5		7.30	15⅝	4¾	1 1⁄16	⅜	2
6	870	7.80	16¾	5 5⁄16			
8		9.00	18¾	6 5⁄16			

TYPE I HANGER DETAIL
340 TYPE I — 3/4" THROUGH 8" HORIZONTAL PIPE
NOT TO SCALE

STRUCTURAL ATTACHMENT MAY BE USED WITH VARIOUS HANGERS, GUIDE, AND ANCHOR ASSEMBLIES.



NOTE:
SPACING SHALL BE AS REQUIRED, BUT SHALL NOT EXCEED THOSE SPANS SHOWN IN TABLE A.

341 TYPE P — STRUCTURAL ATTACHMENT DETAIL
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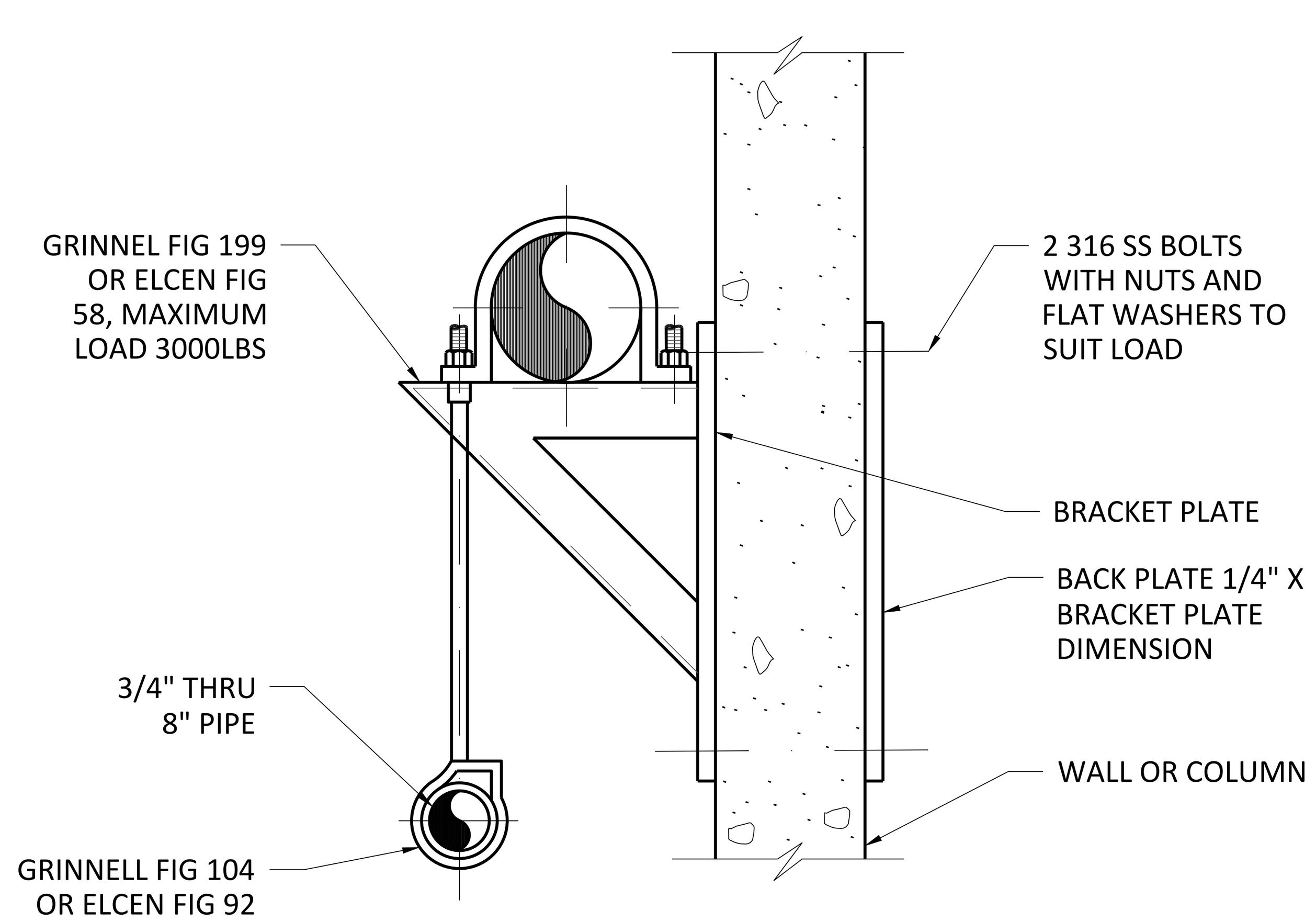
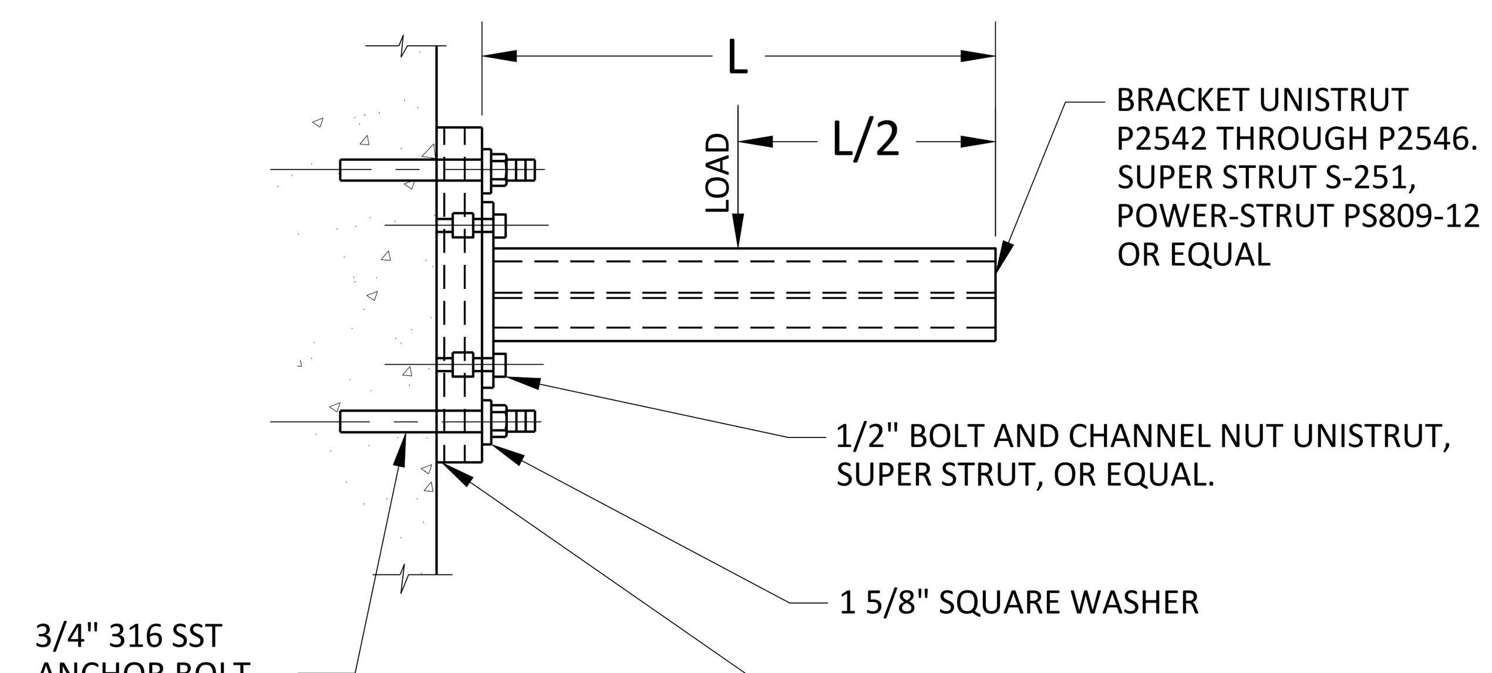


340 TYPE T — PIPE SUPPORT DETAIL
NOT TO SCALE



CAPACITY AT MID-POINT

L	LOAD
12"	1000 LBS
18"	650 LBS
24"	500 LBS
30"	400 LBS
36"	350 LBS

BRACKET MAY BE USED WITH VARIOUS HANGER, ROLLER, GUIDE AND CLAMP ASSEMBLIES.

SPACING SHALL BE AS REQUIRED, BUT SHALL NOT EXCEED THOSE SPANS SHOWN IN TABLE A.

341 TYPE K — STRUCTURAL ATTACHMENT DETAIL
NOT TO SCALE

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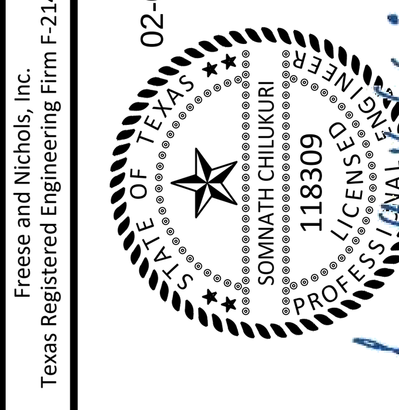

02-01-2022

FREESE AND NICHOLS
11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
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CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
STANDARD DETAILS
STANDARD DETAILS II

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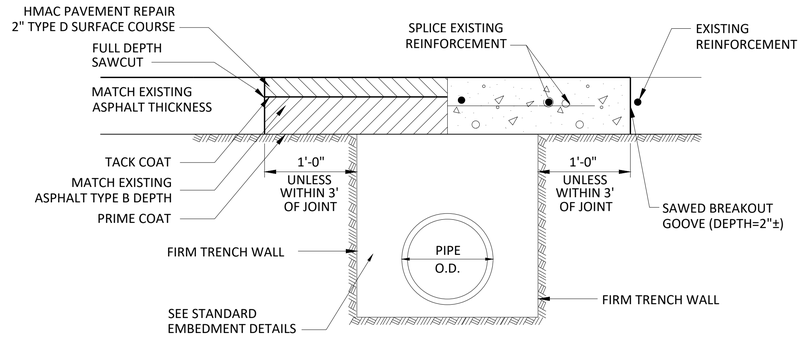

NOTES:
1. WHEN REMOVING CONCRETE PAVEMENT THE CONTRACTOR SHALL ENDEAVOR TO LIMIT DAMAGE TO EXISTING REINFORCEMENT SO IT MAY BE EMPLOYED IN THE REPLACEMENT OPERATION. IF ORIGINAL REINFORCEMENT IS CUT OR BROKEN, REPLACEMENT BARS OF THE SAME SIZE SHALL BE INSTALLED BY DRILLING AND DOWELLING AS DIRECTED BY THE OWNER.

6 CONCRETE PAVEMENT REPAIR

NOT TO SCALE

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11200 Broadway Street, Suite 2320
Pearland, Texas 77584
Phone - (832) 456-4700
Web - www.freese.com

CITY OF BEAUMONT, TEXAS
PINE STREET SWTP POLYMER SYSTEM AND CHEMICAL STORAGE TANK IMPROVEMENTS
STANDARD DETAILS

STANDARD DETAILS III

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REVISED -
CHECKED ####

NO.	ISSUE	BY	DATE

FILE NAME MP-ALL-DT-TYL01.dwg

VERIFY SCALE 0 1 Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET SD-3

SEQ. 36

ACAD Rel: 24.0s (LMS Tech)
Filename: N:\WW\MP-ALL-DT-TYL01.dwg
Last Saved: 12/6/2021 1:08 PM Saved By: 04295

Plot Date: 1/26/2022 4:12 PM Plot By: 04295 Filename: N:\WW\MP-ALL-DT-TYL01.dwg